From the system builders. The system builders' computer. Argus 700 Series 2. FERRANTI Computer Systems

COMPUTER WEEKLY

AN exhibition of up-to-date technology and engineering opens to the Geordie public this week to celebrate the 900th birthday of Newcastle-upon-Tyne.

It takes place at the University campus, where specially purchased inflatable halls house an impressive range of products which draw on traditional and new aspects of industry in the North East.

Despite losing the battle for the Inmos site, Newcastle shows a lively interest in the possibilities that open up when engineering skills are linked with the power of the microprocessor.

For that reason the City's Polytechnic is linked with the University and the software house CAP-CPP in the Microelectronics Applications Research Institute, MARI, based in Newcastle's Jesmond Road.

In MARI's wake a number of specialised software houses are springing up in the North East, and the region even boasts a home-grown machine, the System 800. It is manufactured in Killingworth, already famous in Geordie culture for its clog-shod champion sword dancers.

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Storage Tech to buy Documation

FOLLOWING its unsuccessful courtship with Amdahl, Storage Technology has announced that it plans to acquire IBM compatible printer manufacturer Documation. Storage Technology chairman Jesse Aweida said that the Documation printer line was seen as a "natural complement" to his company's storage equipment.

The two firms have signed a letter of intent to merge under terms that will give Documation shareholders 0.85 shares of Storage Technology stock for each of the 3,050,000 million shares they hold in Documation. This offer values Documation at $52 million based on the $20 value of Storage Technology shares at the end of August.

Fastest

Colin Cook, Northern Europe managing director of Storage Technology, said that the number of people in Documation in this country fitted very well Storage Technology's expansion plans for the next year, and he anticipated that both companies' product lines would be offered jointly by the two sales forces.

Documation's product line includes the 3000 lpm Impact 3000 which is the fastest line printer available, and the company is set to introduce a high speed laser printer called Laserpage to compete with the IBM 3800.

But Documation has recently been through a period of serious financial problems and management shake-ups, mainly because of its extremely rapid growth. In its financial year ended February 1 the company reported a turnover of $90 million, a formidable 53% increase over the year before. But it made a loss of $9.5 million compared with a $6.5 million profit a year earlier. At the time Documation cited the cost of setting up its plant in Ireland as a major cause of the loss.

The company's new chairman, Richard Testa, has denied that Documation was interested in Storage Technology's offer because of its financial problems, adding that many of them had now been solved. Testa replaced Documation founder Ray Halbert as chairman about four months ago.

Documation headquarters is at Melbourne, Florida, and its European operations are currently controlled by Documation World Trade based at Esher, Surrey.

Fujitsu picks Eire — but manpower will be decider for NEC

EIRE has been chosen by Fujitsu as the location for its first semiconductor plant in Europe. The £40 million factory at Tallaght, near Dublin, will manufacture mainly microprocessor and memory devices and should create 1,000 jobs by 1985.

Customer

One customer for the memory chips is likely to be Amdahl which is 28% owned by Fujitsu and has had its own plant in Dublin for about two years.

Meanwhile, another Japanese semiconductor firm already manufacturing in Ireland, Nippon Electric, looks like choosing Livingston New Town in Scotland in preference to Dublin as the location for its third European plant.

Nippon Electric chairman Dr. Kogi Kobayashi visited Livingston last week and a decision is expected by the end of this month.

The £20 million Nippon Electric development is expected to provide 600 new jobs within four years and the two organisations bidding for the prize are the Scottish Economic Planning Department, part of the Scottish Office, and Eire's Industrial Development Authority which successfully wooed Fujitsu.

Incentives

Despite financial incentives offered by the IDA, Nippon Electric is understood to favour Scotland for its third factory because of the greater availability of labour.

● A Commons Select Committee has recommended that the job of finding overseas investors for Scotland should be done by one body, like the Irish IDA. The committee says this should be the Department of Trade's Invest in Britain Bureau as opposed to the Scottish Development Agency, the Department of Industry and the Scottish Economic Planning Department as at present.

Help with assessing viewdata

BRITISH TELECOM has bought the Computex viewdata software from the London-based consultancy Joan de Smith and Partners and a Digital Equipment PDP 11/34 to run it on, from Allen Computers International, a bureau and DEC OEM supplier.

The system is to be used at British Telecom's research laboratory at Martlesham, Suffolk as part of its work on assessing new viewdata techniques and in measuring the performance of viewdata systems generally.

The Computex software consists of a series of modules written in DEC Basic Plus to run under the RSTS time sharing operating system.

Joan de Smith and Partners is considering running a publicly accessible service with Allen Computers when it can identify a large enough single application group, such as 1,000 accountants in London wanting a specialised service.

NEWS IN BRIEF

ICL bid shot down

ICL's first attempt to enter the defence business has failed and the UK Air Defence Ground Environment, UKADGE, contract has, as expected (CW, September 4) gone to the UKSL consortium of Marconi and Plessey, with Hughes of the US providing the computers. Some of the work under the £100 million contract will be subcontracted to Thomson of France, and NATO is paying 80% of the bill.

Major centre

BURROUGHS is to establish a major European training and computer distribution centre at Milton Keynes. The first stage will be a 160,000 square foot residential college to house 400 students.

Isher-Woods bought

LUTON micro dealer Isher-Woods has been taken over by HB Computers of Kettering and will be renamed HB Computers (Luton). It will concentrate on Sharp, Pet and ACT 800 series kit.

Impcon

THE headline on our story of August 28 about a version of the Impcon manufacturing control system written in Cobol for Data General machines could have given the impression that it was developed by systems house, Bunzl. Impcon is a proprietary product of Computer Systems Development and Bunzl is a licensee for the Digital Equipment version of Impcon written in Basic. Cable and Wireless subsidiary, UK Services, is a licensee for the DG version.

IDMS by default

● From front page

finance — the strategy study was directed primarily at housing development, which provided a comprehensive model for evaluation.

The decision to buy an ICL 2956 to replace existing hardware narrowed the field to IDMS and Total. Factors considered were separate data dictionary software, query languages and teleprocessing products.

IDMS was found to be adequate for Camden's needs, despite reservations on query language facilities, quality control, security and integrity of data; and the system's operational and long-term flexibility. [illegible]

This experience, and other obstacles in the search for a competent database, are set out in Local Authority Database Software Needs — A Final Report, published last week by the London Borough of Camden.

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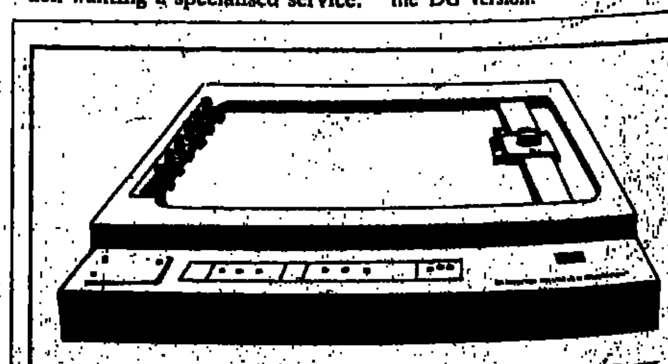

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Briefing

Users have their say

HONEYWELL comes top and Burroughs and NCR share bottom place in the first Datapro/Computer Weekly poll of user satisfaction in the UK mainframe market.

There were no outstanding black marks against NCR in the detailed analysis, but although Burroughs' hardware and software came out on top, the company scored dramatically badly on technical support.

Commenting on the results, Burroughs says that it has been taking steps to improve matters: by the end of the year five new support centres will have opened, a total reorganisation of its field engineering organisation is at an advanced stage, and online diagnostics is being implemented.

"All this has happened since our outline plans were revealed to our users group by Mr Bill Conlin, vice-president and group executive of Burroughs International Group, last October," a spokesman added.

Datapro details — Page 17.

Second suit

A SECOND legal action against former Gamma Associates member, Karlin, is being initiated by General Robotics of Hartford, Connecticut. This time the US firm is submitting a petition for winding up Karlin Computer Services for alleged default of debts. They are completely different from the alleged debts that form the basis of the first legal action against the Karlin group of companies (CW, August 21).

Magic disc

ACSYS is the magic word that Dr Gene Amdahl hopes will open doors for a bright new future in the IBM-compatible supercomputer stakes. Provided that the name runs into no legal snags, his new company, which is due to launch its first product in a little over three years, will be called Acsys Corp.

IBM replacement

A FIERCE new processor to replace the ageing IBM 3705 is expected before the end of the year, but observers differ over what the announcement will include. One school of thought believes that as well as running the SNA network control program, it will also run the VTAM access method.

IBM adds 4341-2

THE anticipated IBM 4341 Model Group 2 machine was announced on Monday and offers between 1.5 and 1.8 times the power of the existing 4341. Available as a field upgrade, it has cache doubled to 16K bytes, maximum main memory of 4 megabytes and provides support for the high speed 3380 disc drive. First UK shipments are set for one year's time and in the UK a two-megabyte version costs £221,000. IBM has also announced that the 3279 colour display can now be used as a console on the 4300s.

Determinedness of the 400 metres hurdles sprinter — Corrie Rost van Tonningen of Control Data BV shows the way to win at the final of Computerstars on Saturday. She won the Best Dutch Individual Ladies title. Full report, see pages 20 and 21.

Peripherals threat — call for a European lab

FACED with fierce competition from US-owned companies, and threatened by the burgeoning Japanese peripherals industry, European-based peripheral manufacturers can only be saved by drastic measures like the establishment of a European peripheral technology laboratory and development contracts from big European peripheral purchasers.

These are key points made in a study carried out for the EEC Commission and the three biggest EEC member countries by Mackintosh Consultants. The study identifies the major weaknesses in the European owned peripherals industry as the fragmentation of the industry and its resources; the failure to recognise Europe as a single high-volume market and the resulting inability to achieve production volumes high enough to provide the same economies of scale enjoyed by US and Japanese manufacturers.

The study asserts that attempts by individual European governments to support their indigenous peripheral manufacturers have perpetuated the fragmentation of the European industry.

The European laboratory proposed by Mackintosh would be funded by grants from EEC member governments and subscriptions from European manufacturers taking advantage of its development work. It would concentrate on key technologies in the peripherals field such as precision engineering, non impact printing, thin film recording heads and media, optional data recording, bubble memory devices and very large scale integration.

According to Mackintosh most of the peripherals used in Europe are built here. The problem is that about 80% come from firms that are US owned. They employ most of the 75,000 people in Europe directly involved in peripheral manufacturing.

Mackintosh believes that big European peripherals purchasers like banks, airlines and PTTs could help European-based manufacturers by specifying a range of key peripheral products that will be required in the future.

The study comes in five volumes, two of which contain detailed recommendations that have been made available only to the EEC Commission, to the relevant government departments in France, West Germany and the UK.

But the three other volumes are generally available at £1,000 each from Mackintosh at Luton and cover the European peripherals market, worldwide trends in peripheral technology and the worldwide peripherals industry.

Bob Willis, treasurer of the Association of the European Information Industry, the body set up to promote the interests of European manufacturers, was not prepared to comment on the recommendations made in the Mackintosh study, but said that they would form the basis of discussions between the Association and the EEC Commission. See Computerview, page 2.

● BIS Ltd is acquiring what has been described as "a substantial shareholding" in Ian Mackintosh International, the group that includes Mackintosh Consultants. BIS executive director, Colin Walpole, is joining the IMI board. See page 5.

AMD follows 2901 with a 16-bit emulator chip

From Eileen Stainer, Sunnyvale, California

SAMPLES of the world's first general purpose 16-bit wide bit-slice microprocessor are due in the first quarter of next year. The chip, called the AM29116, comes from Advanced Micro Devices and follows that company's AM 2900 series, which has swept the board in the processor emulation market, being used in at least one model by almost all the world's major minicomputer companies.

According to an AMD spokesman, an 8-bit slice was considered not worth the development time and cost.

"Most people who use the slices build them up into 16-bit configurations, and 8-bit slices would be just another intermediate step," he told Computer Weekly.

"Our bit-slice business started to build up about 18 months ago, and we now expect sales to double every year for the next few years." Sales of the 2900 are expected to reach $150 million this year.

The AM29116 will have an instruction cycle of 100 nanoseconds, and can execute instructions in either 16 or 8-bit modes. It comes in a 48-pin package with emitter-coupled logic internally, and TTL converters on all inputs and outputs.

To provide adequate chip storage, 32 working registers are arranged in a single-port RAM architecture.

A bit-slice microprocessor is an uncommitted arithmetic-logic unit which can be microprogrammed with any desired instruction set, and they can be ganged together to produce a machine with any desired word-length. The new AMD part will be as equally attractive for people wanting to do emulations of 32-bit mainframes as it will be to 16-bit minimakers.

AMD intends to make the 29116 family comparable in size to that for the 2900, and parts under development for launch with the 16-bit chip include a sequencer and a register PROM.

Using a bit-slice microprocessor to emulate an existing machine usually involves some trade-offs between 100% software compatibility and speed. The advantages are clear if the success of AMD 2901-based processors like the Honeywell Level 6/23 and the Data General Nova 4 are any guide. The AM 29116 includes an instruction set for controller applications and can be used in industrial control, communication and modem applications as well as for data processing.

B5900 entry price slashed

WITH a simultaneous worldwide launch of its B5930 processor last Tuesday, Burroughs has dramatically reduced the entry price into its large systems family.

The machine, previewed in Computer Weekly (August 14), has a rock-bottom base price of £160,000 for which the user gets 1.5 megabytes of main memory, two displays, one peripheral and one data communication subsystem and four line adaptors. Software is separately charged.

The B5930 is the bottom model in Burroughs' large systems family, which currently includes several B6900 and B7800 models. The previous cheapest model in the family was the B6920 which costs £250,000 for a configuration similar to the smallest B5900, but with 2.2 megabytes of main memory (CW, March 6).

The B5900 has a 32-bit wide data bus and a 30-bit wide control bus, and the processor occupies 17 circuit boards and 12 square feet of floor space. "Minimal" air conditioning is required and power consumption is only 3.5 KVA. Etched backplanes limit the need for external wiring, and it has one-tenth as many chips as the last generation B6800.

Burroughs has identified a particular dual processor configuration as ideal for the UK market. It consists of two processors with shared input/output subsystem, network processor, tape subsystem, 800 megabytes on disc and a line printer and costs £370,000. Cobol plus data management, communications and transaction processing software would add £40,000 to the price. First deliveries are set for second quarter 1981.

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COMPUTERVIEW

European peripherals — a terminal case?

PERIPHERAL manufacturing in Europe is dominated by US manufacturers because the computer industry in Europe is dominated by US firms, as it has been since the very earliest days. So why should the EEC and its member governments start worrying about the future of European-owned peripheral manufacturers when it appears to be 20 years too late? Why did they bother commissioning Mackintosh Consultants to produce a 1,000-page study recommending how European-based manufacturers can survive and possibly even prosper?

One of the main justifications is underlined in the part of the Mackintosh study that looks at the growth of the European peripherals market during the 1980s. It shows that shipments of peripherals by computer manufacturers to their own subsidiaries – the captive market – will grow significantly over the next 10 years, but not nearly as fast as shipments of OEM peripherals which are expected almost to triple in value over the period.

No doubt the rapid growth in OEM peripherals sales, which started in earnest with the emergence of commercial minicomputer systems houses, will be accelerated by the microcomputer boom and provide fresh opportunities for European peripheral suppliers to emulate their US counterparts. The big question is whether they will be able to meet this challenge.

On past form alone the answer ought to be a depressing "No". The Mackintosh study underlines the sad fact that European-based manufacturers generally speaking have failed to treat Europe as a single marketplace in the way that US firms see the whole of North America as one big outlet, and so have missed out on the economies of volume production enjoyed by the US industry.

But the most worrying point made in the study is that European-based manufacturers are now in real danger of falling behind in technology, to the extent that Mackintosh sees EEC intervention in the form of a European peripherals technology laboratory as the only effective means by which European-owned industry can keep its head above water.

The British may have failed to excel at the rather vulgar business of high volume manufacture and marketing but at least until now they have been able to take comfort from being clever technological innovators. In future they may be devoid even of that consolation, because technology these days costs a lot of money to develop and the people with the money are the US firms with efficient and profitable manufacturing operations.

ICL, the only UK computer manufacturer with the size and resources to make a significant impact on the market, has virtually dropped out of peripheral manufacturing altogether. To be fair to ICL, it buys from some European-owned manufacturers like the UK's Data Recording Instruments and Logabax of France, although the latter firm is now benefiting from a £15 million matrix printer contract at the expense of DRI. But ICL has been taking its big disc drives from Control Data-owned factories for years and now looks set to start importing 6,250 bpi tape drives from Storage Technology in the US, because CPI Data Peripherals at Stevenage was unable to develop a satisfactory 6,250 bpi drive to manufacture itself.

The Stevenage firm is majority-owned by Control Data, so the killing of the 6,250 bpi drive project provided a timely warning that living under the umbrella of a big, rich and even paternalistic US company is no guarantee of long-term security. All tape drive development has now been transferred by Control Data to the US.

But there could be no better illustration of the points made in the Mackintosh study than the case of United Peripherals Ltd, the disc drive manufacturing operation being set up at Crewe by DRI. The UK firm was forced to give Control Data subsidiary Magnetic Peripherals Inc a 25% share in UPL in return for the rights to manufacture disc drives developed by MPI. The move will, it is hoped, provide employment for a lot of people, but it hands over the technological initiative to the US company and increases DRI's dependence on US-developed technology for its survival.

According to Mackintosh the state of European-controlled peripheral manufacturing today is not entirely hopeless.

Siemens builds big disc drives for use with its own systems, CII-Honeywell Bull manufactures cartridge disc drives incorporating its own thin film head technology and Olivetti, which is a very substantial manufacturer of floppy disc drives for its own small systems, could become a big OEM supplier.

Moreover, Siemens and Philips have acquired substantial expertise with laser technology – Siemens in its high speed printers and Philips with optical disc storage, a technology offering massive growth potential.

But rising ominously in the East is the Japanese peripherals industry, making the future for the Europeans look even more uncertain.

LETTERS to the EDITOR

The advantages of practical training

OF course we at NCC agree with Bernard Allen (Op Spot, August 21), that employers would do well to recognise the advantages of engaging people who already have practical training. I am glad to report that over 50 per cent of those who have completed Threshold courses during the last two months already have jobs, many in programming, but many more in operating.

What some employers do not yet appreciate is that every Threshold graduate they take on as an operator has also done some practical programming, and is therefore available to step into the breach when a programming vacancy occurs.

I find that this is the practice of many companies, to take on operators with a view to moving them later into programming. This surely makes much more sense than being almost continuously short of programmers, and spending thousands of pounds in vain attempts to poach experienced programmers from other sites.

Just one little word of correction to Bernard Allen: Bec/Tec is a joint committee which validates courses and issues a qualification (now adopted by the Threshold Scheme), and is not a third government training scheme.

There is a third government training scheme, as well as TOPS and Threshold; but in contrast to those two, which are aimed at the unemployed, the third scheme provides grants to employers to encourage them to increase the number of people they have trained. The grants are substantial, and are available through Industry Training Boards, or for those organisations not in scope to an ITB, through NCC.

GEORGE PENNEY
Careers projects manager
National Computing Centre,
Manchester.

Older entrants

IT is not often, even rare, that I find myself in such total agreement with my old friend George Penney, as I am with the sentiments contained in his letter of August 28 on the question of older entrants into computing.

There is no question that we can select and train older people – in fact we have done it. The problem lies not with the schools or MSC, but with employers who are reluctant to take on the 35-plus entrant, whereas they will probably get a longer term of service from them, often bringing with them a higher degree of maturity and/or business experience.

Like you, George, I would be pleased to hear from any potential employer who is willing to declare his acceptance of older "juniors". We have a number of things going on currently which they might find of interest.

ROBERT MOSCROP
Education director
James Ross Consultants,
Birmingham.

It's an ill wind . . .

YOUR news item on the disruption caused by the Mount St Helens volcano (CW, August 28) identified a Computer Sciences customer, Carnation Foods, among the sufferers. However, there is a brighter side to the story. Carnation uses the CSC Infonet network service to model future production requirements across several factories. When their french-fry factory at Moses Lake was shut down by a three-inch ash fall-out, the Infonet model rapidly gave them an alternate shipping and production schedule and saved the day.

I know Mount St Helens has been blamed for our bad weather but if things get worse . . .

GAYLE McVAY
CSC UK – Infonet

PAYE principles

IN her letter (CW, August 28), Delia Venables shows that she is out of touch with the intentions and requirements of the Inland Revenue's PAYE system. One computer or many, this will be the largest computerised system in Europe. There never was any intention to have online access to records anywhere in the country relating to any individual. Given the principle of one thing at a time we either computerise the PAYE system as it stands, or we change it – not both at once.

The PAYE system has to be able to trace taxpayers in order to give them credit for the withholding tax they have paid. The tax systems that do not trace where the taxpayer is working now inevitably overdeduct tax. As one big central index is not a very good idea, the Inland Revenue proposed regional computers as a half-way house. It is a question of a compromise on how many computer files have to be searched in order to find a taxpayer's record.

Every tax office has to operate the same system, otherwise it becomes possible to "shop around" amongst tax offices to see where one can get the best tax deal. The only way known of achieving identical results is to use identical programs.

The Inland Revenue's outline specification is a formidable document. The system has to operate nationally through local tax offices. There is a lot more to it than the file you see upside down when you raise a query at the tax office counter.

C. C. DILLOWAY
Director,
Dilloway and Son
Stroud,
Glos.

COMPUTER Weekly is always pleased to hear from its readers. Drop a line to The Editor, Computer Weekly, IPC Dorset House, Stamford Street, London, SE1 9LU.

Cobra lives . . .

MELVYN Morris of Forward Computing was quoted (CW, August 14), as referring to "Dataskil's SuperCobol formerly Cobra".

Cobra is a macroprocessor incorporating automatic Cobol lexical analysis and partial syntactic analysis. SuperCobol is a set of very high level Cobol extensions implemented as a library of macros. Cobra is used as the macroprocessor within the SuperCobol system. Both products are marketed by Dataskil and Cobra Systems and Programming.

SuperCobol is for people who want a ready-made tool to assist in the rapid development of applications, whereas Cobra is for people who have particular requirements of a programming language based on Cobol and have the resources to develop or purchase their own macro library.

ALAN HEYWOOD-JONES
(one-time developer of Cobra)
Coulsdon,
Surrey.

1984 and all that . . .

THIS week's example of the strange things people say in the media about computers was sent in by David Kohn, of Finsbury Park, who wins £5.

A police electronics engineer admitted in the Johannesburg Magistrates' Court yesterday that, by applying unerring logic, a winning number could be determined in an electronic computerised card game played in a Hillbrow casino.
Col R. D. Hull said the electronic computerised machines have an algo rhythm, which is a series of rhythmic manipulations to determine the outcome of a game.
The algo rhythm is a "mathematical recipe for numbers" which is the key to the game. The programmer knows the key.

Johannesburg Star

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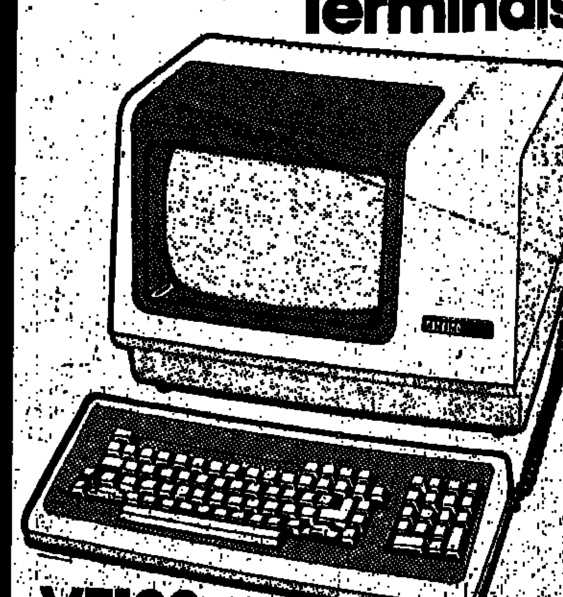

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Three in Hitachi M-200H race

IBM users in the UK interested in the powerful Hitachi M-200H can now choose between three suppliers – BASF, National Advanced Systems and Olivetti Computers.

All three are now selling versions of the Japanese machine modified to provide what ought to be complete IBM compatibility, so Amdahl is no longer the sole challenger to IBM at the top end of its range.

Availability of the BASF version, the 7/80, was announced in August (CW, August 14) and this week National Advanced Systems unveiled the AS/9000, which is the M-200H with modifications developed jointly in Japan and the US by NAS and Hitachi personnel.

At the same time Olivetti Computers, which shipped the first M-200H to a European customer in July, has formally launched the UK subsidiary that it promised two months ago (CW, July 17). Olivetti's version of the Hitachi machine is called the 5560 and the first user is the Piedmont regional government in Turin.

The M-200H is rated at about 8 million instructions per second and as the AS/9000 it offers 1.8 times the performance of the IBM 3033 uniprocessor while matching the power of the 3033/AP-1, 3033/AP-2 and 3033MP. The biggest AS/9000 with 16 channels and 16 megabytes costs £2.4 million compared with £2.87 million for a 3033/AP-1 with the same features.

The AS/9000 will be able to support the three megabyte transfer rate of the 3380 disc drive by the third quarter of 1981 and data streaming mode for the 3375 will be available in the first quarter of 1982.

Release 1 of MVS System Products will be supported on the first AS/9000s to be shipped and Release 2 soon after its announced availability in June next year.

Even in its uniprocessor form the M-200H outperforms the biggest Amdahl machine, the 470/V8, which is rated at about 1.5 times the power of a uniprocessor 3033. In Japan Hitachi is starting to ship versions of the M-200H with two, three and four processors.

Peter Williams, managing director of Amdahl in the UK, refused to comment when asked about the new three-pronged threat to Amdahl's as well as IBM's UK customer base and future sales.

Full support for the IBM 4300 series instruction set and the 4300 native mode operating system, DOS/VSE, are provided by two field upgradable machines added to the AS/5000 family from National Advanced Systems. Called the 5000E and 5000N they outperform the 4341 by 20% and up to 60% respectively. They can be field upgraded to the AS/5000 which offers 15% more power than the IBM 3031.

£8.5 million expansion plans

WHILE Nippon Electric is still deciding whether or not to locate its third European plant in Scotland (CW, September 11) General Instrument Microelectronics has announced an £8.5 million expansion plan for its Glenrothes plant.

According to GIM, the new 40,000 square feet plant will be fully operational by 1985 and will be equipped with the latest fine line VLSI apparatus.

GIM at Glenrothes is probably best known generally as a manufacturer of chip sets for viewdata terminals and entertainment products like TV games and music synthesisers. But the Glenrothes plant also fabricates chips for telecommunications applications and GIM says that it is the only firm in Europe at present making ROM chips. Other products from Glenrothes include EAROMS and 8-bit microprocessors.

RAM prices cut

JAPANESE competition has caused Harris Corp to reduce its 4K CMOS static RAM prices by 50%.

ICL 'tight-lipped' over Storage Tech tape drives

ICL still remains tight-lipped about its interest in the Storage Technology 1900 series 6250 bpi tape drive over eight months after talks between the two firms were believed to have started (CW, December 20/27, 1979).

The compact 1900 drive is already supplied to Honeywell in large OEM quantities and is understood to be the clear favourite to be purchased by ICL in place of the ill fated ATS III 6250 bpi drive that CPI Data Peripherals was developing at Stevenage.

Work on the ATS III was killed late last year so ICL had to look elsewhere for a 6250 bpi unit. The demise of the ATS III affected the jobs of about 90 people out of the 300 employed at the Stevenage plant.

An ICL spokesman refused to confirm either that it has signed a contract with Storage Technology or whether negotiations were taking place.

Storage Technology is by far the biggest supplier of big IBM compatible 6,250 bpi tape drives in the world and with the 1900 the company took advantage of its expertise in 6,250 bpi Group Code Recording to produce a low cost OEM drive for use with small systems and minicomputers.

Meanwhile, ICL has started to take delivery of matrix printers from Logabax under the £15 million three year OEM contract that the French manufacturer won in competition with the UK's Data Recording Instruments (CW, July 3).

The Logabax units being delivered to ICL are the 100 chps 100 series and the 180 chps bi-directional 200 series.

More bids

BUNKER Ramo, the US firm whose banking terminals are sold to end users in the UK by Univac and Plessey, is considering takeover bids from several unnamed US firms. Last year it rejected a bid from Fairchild Industries after the aerospace manufacturer had acquired a 21% holding.

Software protection on Pet based WP system

A UK word processing package for the Pet personal computer is to be sold worldwide by the machine's makers, Commodore, in a deal that is expected to total $750,000 in sales. The package, from Dataview of Colchester, includes a novel electronic device intended to prevent unauthorised duplication of the software.

Dataview's package, called Wordcraft, can operate on the new 80-column Pet, providing a word processor with a normal half-page screen, twin floppy discs, and Qume printer for £4,200. The software can be purchased on its own for £350. French and German versions are being produced.

To make sure a separate copy of the software is purchased for each machine in use, a special device like a small plug-top is supplied that has to be in place in the user port of the Pet all the time the program is in use.

The plug, known as a "dongle," contains a random number in a PROM that has to match a number held on the software floppy disc in order for any disc transfers to take place. The discs can still be copied, but to make a duplicate dongle would be difficult.

There are three ROM slots inside the Pet that other systems houses are using for security purposes, but changing these requires opening up the machine. The dongle is easily attached to and detached from the user port at the back, where the cassette deck is normally plugged.

Text is divided into chapters of about 10,000 characters, the amount that can be held in memory at one time. The keyboard is the standard one that comes with the 80-column Pet, and so editing commands are given by typing letter codes.

Dataview feels that, while Wordcraft's ease of use and range of functions do not match those of a purpose-designed word processor, they come quite close.

Decoupled printing and file merge are not available at present owing to lack of memory but these are being worked on.

THE QUIET REVOLUTION

Liberal dose of new technology demanded

A RESOLUTION calling for massive government assistance to "the new industries relevant to the 1980s to replace non-viable trades" was passed by the Liberal Party at its Blackpool assembly last week.

Party technology spokesman David Penhaligon MP said he and his colleagues were "very concerned that Britain was getting left behind on new technology."

Penhaligon's main concern, he told Computer Weekly, was that the new products we needed would all be imported, paid for by North Sea oil and then, when the oil ran out, we would discover we had lost all the old jobs and not created the new ones involved in new manufacturing. There needed therefore to be a major increase in investment and a change in the government's attitude.

This attitude was exemplified, he said, by the long delay over approving money for Inmos. Computer consultant Delia Venables, prospective Liberal candidate for Brighton Pavilion, agreed, saying that "expecting a free market to ensure Britain's future in new technology is 'pie in the sky'."

Penhaligon and Venables both agreed that a less centralised system for PAYE would be preferable, both for reasons of efficiency and security.

In the Liberals' debate on unemployment, assistance was recommended to help start up co-operatives as well as new firms dealing with advanced technology.

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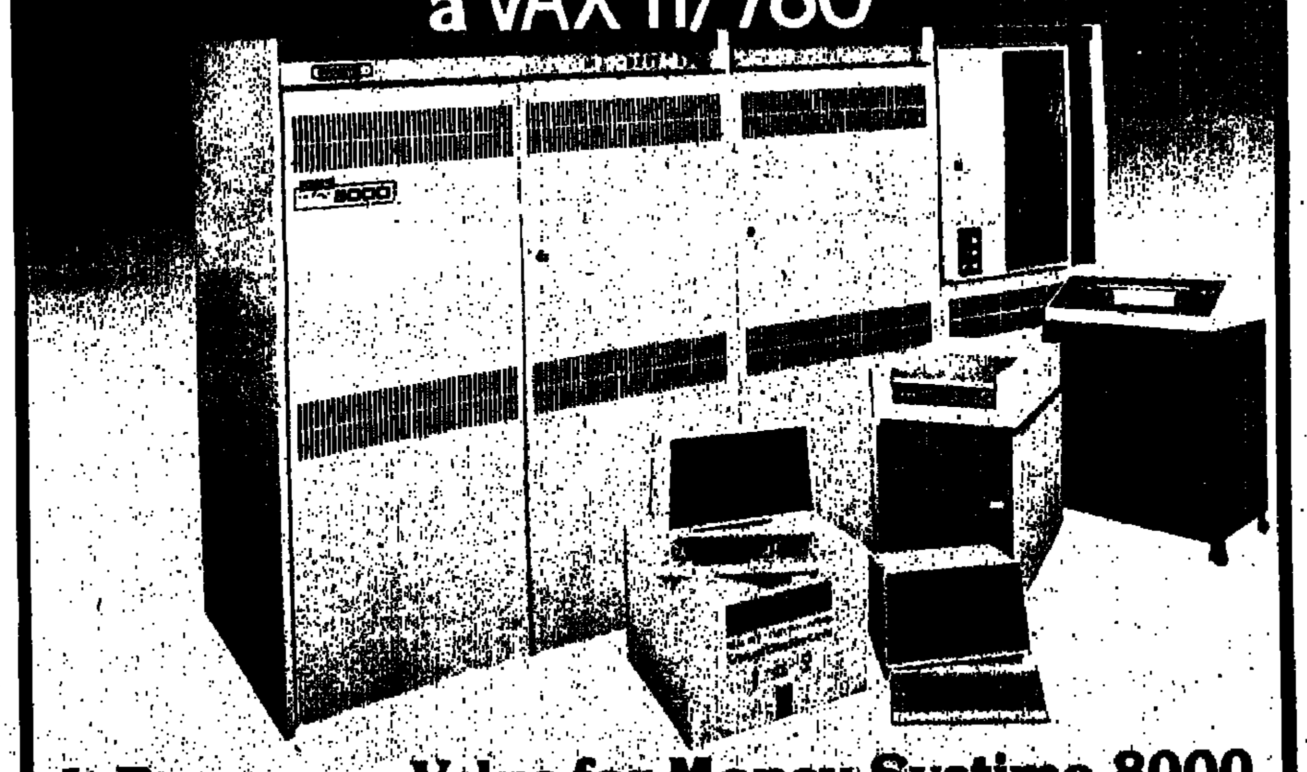
Telephones see the light

THE first 140 megabit per second link in British Telecom's 280 mile optical fibre network has been installed by GEC Telecommunications over a 47 mile route from London to Reading. The link provides a capacity of 1,920 speech channels, pulse-code-modulated at 64K-bps.

A five-mile link between Walsall and Brownhills, near Birmingham, has also been completed by Plessey and BICC with a transmission rate of 8 million bps and a capacity of 120 speech channels.

What Happens when you Systimize a VAX 11/780



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Downtime by Chad

Flight fright

COMING back from the US in a jumbo jet the other day (he remarked casually as if he did this every week) I tried to turn on the reading light for my seat. Lo and behold, the light for the seat two to my left came on.

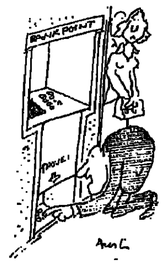
"Aha!" thought my razor-sharp brain," "I will try pressing the switch on that seat."

This I did, and the light for the seat in between came on. Finally, the switch on that seat turned on my light.

It occurred to me that if this was the standard of the wiring in the cabin, what was it like on the *flight* deck?

When the pilot pressed the button to lower the landing gear would that dump the fuel?

I know in these days of mass travel they can't be expected to make the music you hear in your headphones and that on the piece of paper in front of you correspond, but they might make a bit more effort to pander to people's phobias by attending to detail.



"I'm trying to get an overdraft."

Have you got hands or digits?

IS your LCD digital watch a rare antique collector's item? Mine is. It was made by Microma, Intel's subsidiary, and I brought it back from California in 1976 when everyone here still had antediluvian LED machines.

People at meetings would see the two dots going on and off every second and would say, "Your watch is winking at me," to which I could only reply: "Don't take it personally."

It's still winking, four years later, and keeping sickeningly accurate time. Herein lies its rarity, as I gather most Microma watches have long since died the death. Everybody who was anybody on the Coast had one in '76, but then Intel pulled out of the bsuiness, having decided it was better at making chips than jewellery.

Sensible enough: it's not quite the same thing selling high-technology components and consumer luxuries.

Still, I intend to keep wearing my faithful timepiece until it or I conk out. It may be a bit feature-lean – I can't for instance tell how fast a runner in Tokyo is going, nor does it play the Bluebells of Scotland – but I will be faithful so long as it gets me to my train on time.

I'm just as glad it doesn't make noises. I was sitting in a meeting with three Americans the other day when we became conscious of this persistent beeping sound.

"Is that you?" one said.

"No, is it you?" the other replied.

Eventually the racket was tracked down to one bloke's calculator.

"Oh yes, it goes off at 3:39 every afternoon," he explained offhandedly, as if that settled the matter.

I'm still waiting to see an LCD grandfather clock. Any sighting, like the first cuckoo in spring?

Electronic clock

THE reason why the gentlemen in my picture are looking pleased with themselves is that they have succeeded in making the BBC 2 clock ultelectronic. You may have noticed on your TV screen a few days ago – if you ever watch it – that the clock looks different. It is now no longer a real clock with hands, with a camera looking at it; instead it is generated by a computer graphics system.

The Beeb first started doing this with the election system last year. On one of the results displays, the hands on Big Ben cunningly set themselves always to the correct time. If you think the programming for this is trivial, consider what happens when the hands are nearly horizontal. The line scan of the TV makes the hands look like staircases. Auntie's merry men have solved this with some clever analogue circuitry that adjusts the rise time of the video signal.

The logo underneath the clock is also generated electronically. This is rather more boring, but it takes four K-bytes of memory to hold one logo with all its colours, even using run-length encoding. Wow!

MICHIE'S PRIVATEVIEW

Looking ahead to trillion-bit dictionaries

Professor Donald Michie is head of the Machine Intelligence Research Unit at Edinburgh University.

I HAVE elsewhere ventilated the possibility of using trillion-bit memories to construct giant random-access dictionaries of scientific facts, each containing, say, a billion question-answer pairs.

Voices will be raised against the new race of blind question-answerers. Knowledgeable and perceptive people will be found to say that an invention which so debases (by dispensing with) human understanding and judgment is better uninvented. Their arguments will be cogent, as were those of Socrates against the related invention of writing (in Plato's Phaedrus).

Socrates first quotes the opinion of the Egyptian king Thamus that "those who acquire it will cease to exercise their memory and become forgetful; they will rely on writing to bring things to their remembrance by external signs instead of on their own internal resources." He cites Ammon against the fallacious view that "one can transmit or acquire clear and certain knowledge of an art through the medium of writing, or that written words can do more than remind the reader of what he already knows on any given subject."

"You might suppose," Socrates adds, "that written words understand what they are saying; but if you ask them what they mean by anything they simply return the same answer over and over again."

In short, Socrates' complaint is that writing fails to pass Turing's Test (according to which the knowledge source must fool the questioner into supposing that he is conversing with a human being). So it does.

Scrapes

So, too, will the trillion-bit question-answerers of the future. But like writing, they will assuredly survive and help to change our world. Will this be good or bad?

Unless the substance of Socrates' complaint is seriously and energetically investigated in the new context, then these giant Q-A systems will be a mixed blessing and could get us humans into some very nasty scrapes. Such data-bases, remember, store only the basic unvarnished *facts* of the given case, and contain nothing corresponding to understanding, inference, judgment, classificatory concepts and the like. Truly, if you ask them what they mean by anything they simply return the same answer over and over again.

So long as the contents of the electronic super-tables remain purely factual in the ordinary sense, then nothing worse is likely to result than widespread exasperation. Infallible answers obtainable on tap, even occasionally valid opinions or directives will be greedily accepted. But the absence of any explanations is apt to imply the answers will be taken on trust – there in bad part.

Why, a chemist user will ask across this pattern from the mass spectrometer indicates that the unknown compound is some particularly pesticide poly-chlorо-aromatic.

Answer: Because the trillion-bit dictionary says so!

The chemist then asks: How does it know? How did this answer get there in the first place? If the supervisible was constructed by the inverse-function method then even telling him exactly how it got there will not make him any the wiser. So he and his colleagues will be goaded into building new explanatory theories of what they find in their super-tables. And this is to the good, and presages new pathways of scientific advance.

But a table of question-answer pairs is not restricted to encoding factual knowledge of this kind. The format lends itself equally well to expressing *strategies*. In this case the table consists of *situation-action* pairs.

Such tables have been constructed on a laboratory scale for sub-domains of the game of chess. It seems inevitable that people will soon be using the same methods for broader task environments. An occurrence (described in this column, CW, October 27, 1977) at the 1977 Toronto IFIP Conference neatly illustrates the danger which may then arise.

Disoriented

Defence of king and rook against king and queen (no other pieces being left on the board) against optimal attacking play can only be achieved in the sense of maximally delaying the inevitable loss of the book. Ken Thompson's database embodying a pre-computed strategy of this kind was exposed to attack by two strong chess masters playing in consultation.

Although no *human* defence would have given them serious difficulty, the masters wandered in circles and complained of a sense of disorientation. What upset them was the counter-intuitive style of ostensibly playing repeatedly losing games en route to the win as set in the books. But this is what the super-table does and must do. Over certain occasions it proceeded to demonstrate that it knew better than they what it was doing.

Suppose that the task had merely tested limits to some extent of complex control in industry, transportation or defence. Two experts devise operating plans for the task. In operational trials the method of intervening manually in the event of malfunction. The system now does the equivalent in industrial or transportation or military terms of "separating its king and its rook".

"Is this a system malfunction?" the experts ask each other. Answer comes there none.

"Expert systems"

Safety lies in ensuring that the disease of inscrutability is never allowed to arise in the first place. Certification of socially critical control systems will doubtless in the end be instituted. But legal requirements that systems be logically transparent and self-explaining will not be enforceable unless the needed advance studies are first done of how to implement and measure these properties. Self-explaining problem-solvers are known as "expert systems" and involve applying to given domains of human expertise general "knowledge-based" techniques now under development.

Donald Michie

REFERENCE

1 Memory trick for infeasible computations. Research Memorandum (MIP-R-122). D. Michie. Edinburgh, Machine Intelligence Research Unit. 1979.

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TEN YEARS AGO

From Computer Weekly September 17, 1970

Philips entered the small computer and minicomputer markets with the introduction of the desktop P880 minicomputer and the P800. As part of a newly completed programme to computerise the production of Post Office telephone bills, eight new 4000 Junior Collector were installed at four Post Office accounting service computer centres.

FOCUS

Suggestions for a practical DP course

THE NCC is proposing to establish a clearing house facility for case studies for use in computer education and training. As over 6,000 studies have already been collected not only will the case studies be of packing-case dimensions but the clearing house will have to be warehouse-sized.

It is not exactly clear just what the NCC is attempting to prove, apart from amassing large-scale standards of documentation and packaging. No doubt such noted centres of computing studies as Hatfield Poly will welcome the opportunity of having a ready-made source of examination material. But it is a safe bet that the stockpiles of case studies will not include the everyday life of the DP manager.

As it is highly unlikely that a practising DPM will be invited to compile a suitable check-list, and even more unlikely that a computer student will ever encounter such a catalogue of practical trials and tribulations, some appropriate guide lines could well be opportune.

Priorities

The real-time case studies will ask the examination student to place in order of priorities (or preference) the following early morning DP routines.

Open and sort mail . . Open and read computer journals . . Discuss contingency planning in respect of the absence of three operators – one ill, one on holiday and one on a course . . Also the current shortage of data prep girls and continuous stationery supplies . Compose an advert for additional DP staff . . prepare salary budget reviews for company accountant . . Apologise to user department for anticipated late delivery of work . . Phone recruitment agency for temporary replacements . . Discuss overtime rates for late shift working with ops manager . . Cancel visit to various sales teams and put off writing grotty letter to British Telecom in respect of late delivery of modems . . Postpone new application progress meeting until next month or beyond . . Investigate reasons for yet another head crash – the fourth in a week . . Contact stationery supplier . . Bring forward weekly P.M. schedule.

Keep in touch

Between dealing with these little local difficulties, the student would be asked to place in order of importance the need for the DP manager to compute course and training schedules, contemplate the cost-effectiveness of PCM peripherals, organise an appraisal of future privacy requirements and show the managing director's nephew round the installation.

The student has to bear in mind the requirement of the DPM to complete the finishing touches to his staff appraisal report, and his talk to the local branch of the BCS. Part Two of the paper would require the student to evaluate the need of the DPM to keep in touch with computer technology and current pay scales. Should Computer Weekly be read from back to front with a little allowance to complete such time consuming features as Puzzler and the occasional crossword?

Learning

Cross words in fact are standard features of the average DP installation; especially following the discovery that a two-hour computer run has aborted two minutes from completion. Not only have the data been wiped from the files but the standby back-up tape has also gone popping open the library door has gone missing. The student will be asked to speculate on appropriate DP expressions.

The NCC has asked anyone who wishes to introduce some computing case studies to get in touch. Once again the industry is related to be missed out.

The academic world is fond of sponsoring seats of learning. Perhaps funds should be found to place one such seat on the inside of a commercial DP installation. It can be guaranteed that levels of learning will be enhanced.

Anyone completing this practical DP course will be nominated for a "DP-A1" (with flowers).

'Top priority for System X' call

THE government should give top priority to putting System X into the UK telephone network and also exporting it, British Telecom managing director Peter Benton said at the inauguration of the first System X exchange at Baynard House in London last week.

"I may be accused of being biased," he said, "but I do not think I am. It is of crucial importance to our growing services industry, which already employs more than 60% of our workforce, to provide it with the finest possible telecommunications network.

"And the manufacturing of telecommunications equipment is the very best opportunity for export. There is a booming world market and we have demonstrated that we are right in the forefront of the technology."

Benton could not say how far forward the production programme could be brought or how much money it would take. "The present task is to preserve the schedule as it is," he said, "but we could re-plan in the hypothetical case that the government did give it top priority."

The UK has slipped from being top telecommunications exporter in 1963 to no longer being a major exporter. System X is thought to be a potential world-beater, but at current investment levels the System X exporting partnership British Telecommunications Systems is aiming only for a 10% share of the £100-million-a-year world market. BTS managing director John Sharpley said this may be £150-£200 million a year by the time the target is achieved.

No tenders had yet been made to foreign PTT's, Sharpley said, but discussions were being held with many of them, and BTS expected its first order in four to five months.

A trade mission had been to China a month ago, said British Telecom deputy managing director John Whyte, and there would be a further visit next year.

An engineer shows some of the boards in the System X tandem exchange installed at Baynard House, London.

Local processing on Mark III network

LOCAL processing is about to be offered in the UK by Geisco, in addition to the interactive and batch processing links it provides to the worldwide Mark III time sharing service.

Called Marklink, the new distributed data processing service will allow up to 16 VDUs to work either locally or remotely on what is claimed to be the world's biggest time sharing service.

Marklink has been developed over the last two years with US users (CW, February 8, 1979) and is based on Texas Instruments 990 series processors and TI VDUs, discs and printers.

The local processor can have between 96K and 384K bytes of main store and between two and 20 megabytes of disc store and can have software as well as data loaded down the line from the Mark III computer centres.

The service is designed to provide the optimum balance between central and distributed processing, as well as providing a solution to the problems of worldwide data communications problems with a single reference point for support.

Geisco aims to compete with hardware suppliers and systems houses and to reach a higher volume market such as retail chains and multiple warehouses. Greater growth is expected in this market than the single terminal per line market. Mark III's growth this year is put at between 25 and 30 % in a remote computing services market valued at £100 million for interactive use alone.

The European service is to be composed of standard options in contrast to the US where applications have been customised for subscribers.

For interactive use, Geisco has developed a set of packet switching protocols called INAP based on X25 and X3. In batch mode the IBM 3780 terminal protocol is used.

Mark III now has 22 access points in the UK from Aberdeen to Southampton, with the latest two opening this month in Sheffield and Northampton. They give access to services including information storage, program generators and over 2,000 library programs available on the Honeywell and IBM mainframes at the three Geisco centres in the US and Holland.

The Mark III service now has over 1,000 UK users and over 5,000 worldwide. It is claimed to offer local call access to 90% of the world's business telephones.

Lies, damned lies and DoI statistics . . .

A MAJOR error in the figure for total imports is the only outstanding feature of the latest set of quarterly statistics from the Department of Industry on sales of computer equipment.

The Business Statistics Office at Newport, Gwent, thanked Computer Weekly for pointing out the error and admitted that it had been overlooked in the checking process, even though it showed a sharp drop in computer equipment imports from £278 million in the first quarter of 1980 to £187 million in the second.

A closer examination indicated that the figures that made up the total were accurate, comparing reasonably with previous quarters, but had been added up incorrectly. The total import figure should have been about £261 million and the Newport office promised that the error would be amended in the next of quarterly statistics.

The import figures are supplied to the Business Statistics Office by HM Customs, along with the export statistics also included in the quarterly information.

Last year grossly inflated figures for exports of analogue/hybrid computers were revealed exclusively in Computer Weekly. They were the result of some export agents entering other types of equipment under the analogue/hybrid heading in their returns to the Customs. The problem was dealt with and the analogue/hybrid figures now look a lot more realistic.

Second quarter 1980 statistics that look accurate include a figure for total sales by manufacturers in the UK of nearly £293 million compared with just over £271 million in the same period of 1979. At less than £224 million the figure for total exports shows a slight drop compared with 12 months before, while imports, assuming that the £261 million figure is correct, were up by more than £26 million.

No jobs to go to at ICL

A TOTAL freeze on recruitment at ICL, part of major efforts to cut back expenditure in the face of what the company describes as a "deteriorating economic situation", has led to 140 graduates losing their jobs with the company before they had even started. Of this year's planned intake of 182 graduates only the 42 who had already joined by last week have been accepted this year.

Over the last weeks ICL has been carrying out a review of ways to reduce expenditure, and the recruitment freeze was the first step taken. The company is not revealing what further economies are likely.

The figure of 182 graduates for this year was already a drastic reduction on previous years: in 1979 over 500 were taken on. The company decided, however, in the spring that economic prospects were not good, and in addition, staff turnover had been falling.

The 140 disappointed graduates have been given one month's pay in lieu of notice and an assurance that they will have priority when the company starts hiring again.

BIS rescues Mackintosh

SOFTWARE and training group BIS has lent a "substantial" sum of money to Mackintosh International and could well take over the electronics consultancy over the next two to three years.

BIS director Roger Graham commented, "We were approached for help by Mackintosh and have an option to acquire the company in the long term if everything works out well between us."

As part of an agreement between the two companies, BIS will get 49% of the Mackintosh shares by the end of the year and 75% over the next two to three years.

Graham went on, "Mackintosh and ourselves have a lot of common interests – we're both in marketing research and DP. In addition to that, Mackintosh has done a lot of work on the automated office and we're going to open a division in that area."

Nixdorf agent

AN AGENT for the UK has been appointed by Nixdorf to deal with the software products from the recently acquired Nixdorf Computer Software Company. Gerrard Data Systems of Harrow is to market NCSC's flagship, the EDOS operating system and other associated products.

Dare you let your *VAX 11/780 Out of its Cage?

If you've got, or are thinking of getting a VAX, it's worth looking at how Systel can expand its processing capacity. Systel will give you transaction processing concurrent with other applications and a distributed processing network.

The Systel Transaction Processing System supports fully interactive transaction processing on up to 256 terminals per processor and up to 6000 MB of easily accessible on line data using data dictionary retrieval techniques.

Efficiency
Systel gives you automatic generation of multi-threaded code to reduce memory and disc access requirements.
It includes centralised file management and supports front end and remote processors for efficient terminal networks.

Security
Systel provides you with password and account access security on individual terminal locations, on individual files and records. Plus, you get fully automatic transaction journalling and archiving with fully automatic data recovery in the event of hardware failure.

System Management
Systel provides; a system usage audit trail plus users time and resource accounting, on line management control of priorities, performance and resources, and full message and mailbox facilities.

System Development
Systel ensures rapid system development with automatic multi-level menu production and high level data and file specification which may include data validation specifications.
The package includes interactive forms and screen layout generation and a high level transaction control language. FORTRAN, COBOL, BASIC or PASCAL languages can be supported.
Systel gives you a completely protected environment for on line system development and operator training.
By the way, a Systime 8000 computer gives you main frame performance at a mini computer price. And right now we've got some highly competitive offers available including Systel if you buy a bundled package..

SYSTEL is the key to an orderly escape

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SYSTIME

*VAX is a trademark of Digital Equipment Corporation.

PAGE SIX for programmers and analysts — by Pamela Rowe

How to get your Open University degree

YOU may write to the Open University for details at any time and they will send you copies of the BA Degree Handbook and the Courses Handbook. Apart from a small number of post-graduates, there are two main bodies of students – undergraduates studying for the BA, and associate students who wish to take one or more courses independently.

Prospective undergraduates must apply during the period January to June of the year before starting study. So application in January 1981 would be for academic year January to November 1982. The associate student may apply from April until as late as October for courses starting the next year.

The courses are all designated as one-half or one full credit. Full credit courses involve weekly correspondence units and entail about 10 to 12 hours of study per week.

Half credit courses carry fortnightly texts and the 10 to 12 hours is spread over two weeks. Besides the credit rating, the courses are divided into four levels – foundation, second year, third year and fourth year.

The university really is open in that no formal qualification for entry is necessary. However credit can be given for some previous study – this is assessed by the university for each case individually, up to a maximum of three credit exemptions.

More advanced courses often rely on the knowledge gained at a lower level and these are quoted as course prerequisites.

A BA degree is awarded for six credits, including any exemptions. Honours classification follows after a further two credits of study and is divided into first, upper second, lower second and third classes.

The maximum you are allowed to take in any one year is two full credits, and the minimum is a half credit.

Assessment

Apart from this you can spread your credits over as many years as you like, but you must complete each half or full credit course within the year.

Assessment is two-way; continuous and by the end of year exam in October/November. Each student is allocated a counsellor to help with non-academic problems and a course tutor. Most courses carry both tutor marked assessment, usually essays and practical reports, and computer marked assessment – multiple choice tests.

A full credit course has about eight TMA's all of which have deadlines for submission. You must pass both the continuous assessment and the three-hour exam to obtain the credit.

Lastly, the vexed question of how much. The university has to raise its fees each year as costs go up, but for 1981 will be £67 for a full credit course, and £33.50 for a half-credit, payable by instalments if desired.

Summer school where applicable will cost £62 per week, inclusive of bed, board and tuition.

Many employers, notably the Civil Service, give encouragement and financial help to undergraduates. You can also apply to your Local Education Authority for financial help.

In cases of real hardship the university runs its own small fund and will do its best to help.

Addresses for inquiries are:

For undergraduate students – The admissions office, The Open University, PO Box 48, Milton Keynes, MK7 6AB.

For associate students – The associate student central office, The Open University, PO Box 76, Milton Keynes, MK7 6AN.

So you can't get enough of programming...

IF you've ever hankered for your own computer at home to play with in the evenings when you can't get enough of programming, why not think about taking an Open University course?

Many of their scientific/technical courses include a home experiment kit, which in the case of computing could mean your own small micro Opus, using a variant of assembler.

This is supplied with TM221 The Digital Computer, an introductory course which aims to give first hand experience of a simple machine and explores the roles of soft- and hardware. It is not, however, a course in creative programming.

Two other courses for the beginner are M251 – an Algorithmic Approach to Computing, and PM 951 – Computing and Computers. Both of these will be replaced in 1982 by M252, also called Computing and Computers.

M251 assumes no previous experience in DP and very little background in maths. The course falls into four main sections.

The first concentrates on the formulation of algorithms, their expression into flowcharts, and the writing and testing of subsequent programs in Basic.

The next section describes the computer not in electronic terms, but as a processor of instructions.

This is followed by a series of algorithms used to show computer handling of non-mathematical data, and commercial processes.

Overlaps

The last section deals with software, particularly programming languages and conversion from one to another by compilation.

M251 cannot be taken in with the other introductory course PM951, since the content overlaps to some extent.

PM951 similarly requires no prior knowledge of computing and only basic arithmetic and algebra. It aims to give a broad view of the subject rather than impart selective skills, with the emphasis on commercial applications.

The course strives both to inform teachers who may need to use computational techniques in their classes, and managers who are feeling left behind by their specialist DP staff.

One quarter of the course is practical, starting with simple exercises, but working up to quite sophisticated techniques. These are applied to topics of current importance in present society.

The replacement course M252 covers much of the same ground as both courses, but combines and revises the material.

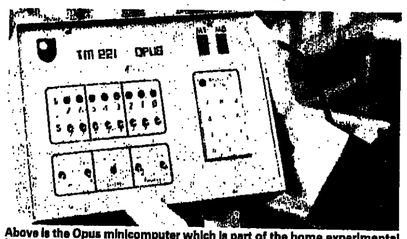
Moving up to advanced levels the university offers two third year courses, M351 Numerical Computation and M352 Computer Based Information Systems.

Numerical Computing is all about problem solving. It uses operational research methods on a few selected areas, chosen as typical of practical computing.

Indeed, the course is predominantly practical and, though programming is not included, algorithms are heavily used. Numerical analysis is also employed where it is relevant.

Teach

M351 aims to teach when a problem is open to a numerical solution, choice of the right method, situations where the method is applicable and evaluation of the results.



Above is the Opus minicomputer which is part of the home experimental kit for the TM221 course. It has 120 8-bit store locations and a built-in 12-key keyboard.

Some prior maths ability is necessary, up to matrix theory and calculus. The university recommends completion of one of several alternative lower grade maths courses.

M352 views the computer as part of an information system and concentrates particularly on databases – their construction, organisation, operation and uses. Much of the work is again practical and examples of a database in action are given for London Online Local Authorities and Standard Telephones and Cables.

This course is designed for students who have already completed some computing courses, and the OU recommend at least TM221 or M251/252.

Four courses devoted to systems are T241 Systems Behaviour, T243 Systems Organisation, T341 Systems Modelling and T342 Systems Performance: Human Factors and Systems Failures.

T241 is suitable for students from any background and no preparatory courses are needed. It explores methods of identifying, describing, modelling and controlling systems with a view to prediction and influence of systems behaviour. A series of eight case studies is linked to systems theory and behaviour techniques.

These include container ports, air traffic control, UK telephone systems, work group structures in mining and motor manufacture, the human respiratory system, economic systems, grassland ecosystems, and a local government system. Computer programs are used to demonstrate particular ways of systems modelling.

Organisation

T 243 is concerned with the organisation of human activities from football crowds to financial and health systems.

T341 is about the use of quantitative models to make key decisions and attempts to banish some of the mystique that surrounds the subject. It also develops a critical approach to modelling, and raises the question of values, such as the relative worth of a facility or the "cost" of an area of natural beauty.

There is a considerable amount of practical computing during the course and a prior knowledge of statistics is needed. It is designed to complement TD342 which aims to develop a practical understanding of culture, from small-scale accidents to large issues of national policy.

It's better than a holiday – students

FOR £62 a week you can have bed, full board, and entertainment in some of the most beautifully situated buildings in the UK. Indeed, if your Open University course includes a summer school commitment, then you *must* attend to gain your credit.

Most students are only too happy to pack their satchels and go back to school, for the week long course at one of the traditional universities has earned a reputation as the high spot of the academic year.

"It's better than a holiday," say many students and trysts are made to meet again next year at a different university.

It's not a restful week though. With only a limited time, full advantage is taken of the universities facilities and the day is intensively structured.

Tutorials and guest lectures are held in the evening for those with the stamina, and it is a tribute to tutors and students that one is caught up in the enthusiasm and attends much more than you've ever intended to.

And you don't stop there.

Hectic

The social life is just as hectic. It starts in the bar after lectures where you actually meet other OU students, and swap tales of the rigours of dissecting a sheep's brain for SDT 286, versus the musical version of Hamlet just declaimed by A 101.

Customarily the evening ends with en masse coffee in the small, help-yourself kitchens on each floor of the residence. The dualism philosophy of Descartes usually giving way to more basic topics as the night wears away.

But one week is enough drained in body and mind the super-saturated student has lived for seven crammed days. He has summoned the energy for the last test and now is content to drive or trudge away from the dreaming spires/looming towers.

Tomorrow is a return to regular domesticity taking with it a pleasant nostalgia for this year's summer school.

Requirement

A summer school can be attached to a specific course or a group of courses from the same discipline. Thus the four systems courses described on this page have a common summer school and once this has been attended for one course, there is no further requirement for any of the other three. Details of summer school obligations are given in the courses handbook.

● I would be glad to hear from any OU students who would like to tell us even some of it to Page 6 on any aspect of their studies.

Puzzler

I NEVER cease to be amazed at the discoveries still being made in the field of "true" alphametics – i.e. those where the words used make up a valid statement.

Here is the latest ingenious composition to come to my attention:

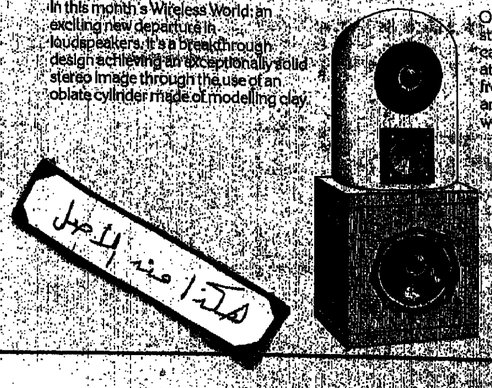
```
  E L E V E N
  E L E V E N
  S E V E N T Y
  S E V E N T Y
  S E V E N T Y
  S E V E N T Y
  S E V E N T Y
  S E V E N T Y
  S E V E N T Y
  S E V E N T Y
  O N E +
H U N D R E D
```

See page 45 for solution.

A new shape -for solid stereo sound

In this month's Wireless World: an exciting new departure in loudspeakers. It's a breakthrough design achieving an exceptionally solid stereo image through the use of an oblate cylinder made of modelling clay.

Other features include a floppy disc store for home computer users, which can store 400K bytes and transfer data at 500 bytes a second; a versatile frequency meter for radio receivers – and the late Professor Dingle's last word on relativity.



wireless world

October. Out now 70p

SOFTWARE FILE — by Claire Gooding

Problems with reproducing vision

MAN'S most important sense is vision. So said Dr Harry Barrow of the SRI Artificial Research Centre. He explained the problems of reproducing the sense in encountered by himself and others who have tried to create a general purpose vision system.

The potential of a machine endowed with effective vision is immense, said Dr Barrow. Making maps, inspecting industrial parts, screening tissue cultures and analysing weather satellite imagery are just a few applications.

In the last few years some fundamental computational principles have been discovered which apply equally to artificial and natural systems, removing some of the stumbling blocks to machine interpretation of visual scenes.

Dr Barrow explained that there is a great deal of "encoded information" which human vision uses for instantaneous recognition of objects.

Interpret

The work of Larry Roberts revealed how the "coding" of brightness, darkness, and contrast could be used to interpret pictures of three-dimensional objects, allowing generation of the scene from another point of view if the tests on corners, shades and perspective are correct.

Further work on shape recognition brought a simple but effective test using convex and concave corners and edges. The Huffman method relies on the realisation of line drawings derived from this test to create three-dimensional shapes where the patterns allow them.

Dr Barrow's own work relies on splitting up a picture into elements of "coding" – light, shadow and other parameters which still need global and background knowledge to unravel their collective significance.

By taking the different elements of vision which human eyes take for granted, he uses each particle of information gleaned to establish the interpretation of a scene.

Such breakthroughs suggest that advanced applications like road traffic control by vision-endowed machines is becoming a possibility, although still some way off.

This year's IBM seminar on teaching computer science, hosted as usual by the Computing Laboratory at Newcastle University, gave the pundits of Artificial Intelligence research a chance to consolidate their achievements so far. Software File takes a look at some of the subjects dealt with, which included language and vision as well as practical robotics and theoretical issues.

AI has come in from the cold

THE 13th IBM seminar on teaching computer science, held annually at Newcastle University, took a bold step this year and discussed that hotbed of controversy, Artificial Intelligence. The message which came across loud and clear was that AI has come in from the cold. The choice of AI as a seminar subject is itself an indication that it has gained respectability since the 1973 Lighthill Report which did so much to destroy confidence in the subject and cut the funds invested in it.

Because of the Lighthill hangover, the participants tended to shy away from the term "Artificial Intelligence". Given the masterly dissection of the term by the Vice-Chancellor of Reading, Professor Page (one person who would not have chosen the subject) one can understand their reluctance. He interpreted "artificial" as "sham".

The term has its shortcomings – it covers a wide variety of subjects and techniques to do with vision, language, kinetics, heuristics, psychology, and occasionally philosophy, to name but a few.

PAGE
AI critic

Perhaps the only thing they have in common is the pulling apart of things we humans take for granted, only to find out how little we really understand. When it comes to modelling in machine terms such human processes as interpreting vision and language, the rules prove to be full of exceptions.

Optimism

The conference was very much a review of what has already been achieved and, despite academic wrangling, there was optimism in the air with a general agreement that funds for research in the field are becoming more easily available as large companies realise its enormous potential.

The problem of coping with so many diverse subjects was dealt with by Professor Sidney Michaelson of the Computer Science Department in Edinburgh in his closing address.

He stressed the need to be selective: "Hard sciences need long-lasting principles." But, he warned, one shouldn't throw things out before principles are established and it would, perhaps, benefit AI to be recognised as an important part of computer science.

Coming from a problem-solving background, Professor Michaelson saw computer science as the study and analysis of systems, with the same basic aim as engineering – to make something for others to use.

"Artificial Intelligence should be part of computer science; it will change the face of computing. Since computing will change the face of society then it is important to teach people about it."

The need for diverse branches to rub shoulders and therefore benefit from one another was used by some people as a valid argument to have separate Artificial Intelligence departments.

Speech is an AI battleground

THE understanding of language in speech and text is one of the areas of Artificial Intelligence which has been a major battle ground for linguists, psychologists and logicians.

Dr Wilks of Essex University gave a review of various theories in the field and explained that many of the "hot topics" in the area 10 years ago were now being looked at again.

One of the facts that has emerged from research on language analysis and reproduction is that a larger framework of knowledge than was once thought is needed in order to interpret language.

Thus given a sentence like "Would you be so good as to give me a hamburger", there has to be an ability to recognise the important part "give me a hamburger" and sort it out from the dross. This demands some understanding of context, as do more complex sentences which "refer back" to subjects.

Wilks reviewed the work of the researchers who have tried to create systems which can interpret sentences using "scripts". The scripts provide a list of contexts which provide a framework for understanding the significance of words.

For example for the sentence "My car drinks petrol" to be properly interpreted, information is needed on what petrol does and how cars really behave.

Since unbreakable rules are difficult to define, Wilks pointed out, many advances made in language systems came about simply through clearing up the problems of the systems before.

Wilks' own work takes into account the different points of view which can exist in a conversation. He also highlighted the need of a system to take into account the ignorance of its interrogator.

A system which answered the question "How many students gained A-grade passes in the maths exam last spring?" with the reply "NIL" would not be giving inaccurate information if the reason for the answer was that the maths exam takes place only in autumn – not inaccurate, but misleading.

Tooling up to prove theorems

THE attempt to build a machine which can prove theorems has played a large role in the development of computer science and Artificial Intelligence. Dr J. Strother Moore of SRI International, the company which grew out of the Stanford Research Institute in California, presented some of the problems involved and his own solutions to them.

The basis of theorem-proving is that, given one fact, one is able to prove another. Reliably developed, a theorem prover would allow a machine to check assumptions made by humans, and verify programs.

Such a tool would be of great value to governmental and research authorities, both of which show interest in Dr Strother Moore's work. Those backing his work already demand positive result – the delivery of conjectures and proofs – which are sometimes valuable for what is disproved or faulted rather than positively proved correct.

Dr Strother Moore's own theorem prover is based on Ansi 66 Fortran, and has led to some useful spin-offs including a useful preprocessing algorithm for fast searching of a file to find the occurrences of a particular string.

The development of the tool involved an investigation of how people try to solve problems, aiming for the accuracy of a clear-thinking trained programmer. It does not attempt to take over decisions which are better made by human beings – it is up to the humans to handle the problems thrown up by the theorem-prover's check of logic and inaccurate assumptions.

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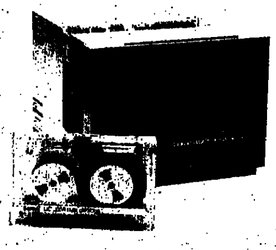

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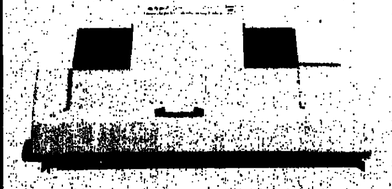

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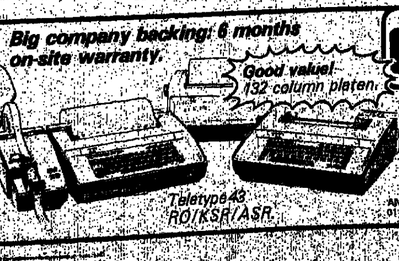

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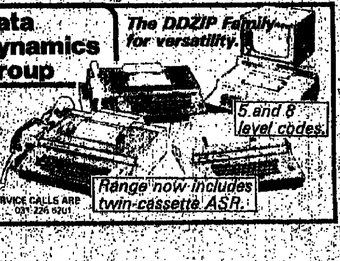

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OP SPOT

by Paul Fisher

SPOT THE HAT: In the picture on the left, Andy Bone, a CAP-CPP programmer, is wearing his operations hat. On the right he is back in the programming room working on Improve/DS.

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Dual role for six proves a success

JOHN Binns is technical manager of CAP-CPP in Richmond, Surrey. "The main thing we do here," he says "is to develop mainframe software." And added: "We felt that due to the nature of our use of our new Magnuson M80/4 we could get the best results by operating it ourselves. Therefore, we don't have any operators as such."

This wasn't quite what I wanted to hear on my first site visit for Op Spot. I had not expected that an attempt to discover the ways of operators would threaten to twist into an applications programming story.

In practice, CPP's absence of operations staff means that six of the 30 employees at Richmond are authorised to double up as operators under the watchful eye of an operations supervisor, Gary Turner.

Career

There are many ways an operator's career can go. It can lead to programming or to a supervisory role in the operations room and maybe to an eventual management position. Alternatively it can lead to plain insanity. In Gary Turner's case it has led to an operator's post with a broad job specification for which he is particularly well qualified.

He started his working life as a draughtsman and then became a Cobol programmer with Datasolve. "Applications programming," he says, "just wasn't me." So, somewhat unconventionally, he made the move into operating where he spent four and a half years ending up as a shift supervisor. He joined CAP at the end of 1978 in sales support and has been working with the Magnuson since April this year.

He now spends approximately half his time in the machine room but his role extends beyond that of a conventional operator. He is responsible for scheduling machine availability, arranging demonstrations, general problem handling, liaison with the hardware vendors and is involved in the consideration of future upgrades.

Captain of the local football team, he says that he thrives on responsibility and that the management job would be a challenge. Perhaps he's also got his eye on a seat on the board.

The computer works conventional office hours and is called upon for a couple of evenings a week. Gary Turner is delighted that he no longer has to do night shifts and is satisfied with his relationship with the programmers at CPP. "It's good to have people who understand the system and are familiar with such things as power-down procedures," he says.

Restriction

From a technical point of view most of his work is with JCL and utilities. He has to cope with a variety of operating systems and says that he prefers to work with MVS/JCL rather than DOS/JCL because the former tends to help itself more. However, he reckons that MVS is not so interesting because it does not demand so much involvement.

The Magnuson is scheduled to run OS in the Morning – MVS, VS1 and VM – and in the afternoon it runs DOS/VS and DOS/VSE. Program lists can be continuously updated from both OS and DOS, the major restriction being that tests have to be carried out in the allocated time slot.

If Gary Turner is not available to load the system one of the programmers can do so. Because of the fact that the current batch of CPP packages is being prepared in Assembler on a machine handling a number of operating systems, it is vital that Gary Turner has a basic understanding of Assembler.

Andy Bone is one of the programmers who also acts as an operator at the Richmond site. He works under OS and so has his machine time in the morning. He is happy to load and run the system because an involvement in operational procedures gives useful insights into the development of the kind of products he is working on.

Project

His current project is the Improve/DS (Dataspace) package which provides a method of data control and data set placement. Frequently accessed data sets are placed on disc and the infrequently accessed ones are migrated to tape.

Andy Bone spends most of the day at his terminal using Roscoe rather than in the computer room. However, development of the package inevitably means that he has to spend a certain amount of time running backwards and forwards making tape mounts.

When asked if his role as a part-time operator had changed his attitude toward ops staff, he said that he had never felt particularly antagonistic to them in the first place. He continued, "If you are responsible, you've only got yourself to call an idiot."

The Computer Program Products arm of CAP deals with mainframe software products. It markets 10 ADR packages and is working on the development of the Improve family which is designed to maximise efficiency in OS and DOS installations.

Spooky

Among the people at CPP there seems to be an almost spooky degree of unanimity about the virtues of the Magnuson M80/4. It is the first machine of its kind in the UK and is supported by CDC disc drives, STC disc and tape drives, a Documation unit record and Data Logic terminal equipment.

The whole thing was up and running remarkably quickly. System generation on DOS/VS took a total of four days, with two of those given over to planning. OS/MVS was installed over a weekend, although it was expected that this was going to take longer when a tape from IBM showed up an error in its distribution library.

Since March there have been two hardware faults, each of which was rectified by Magnuson engineers making a board change within two hours. Gary Turner was appointed to co-ordinate machine use and the six programmers learned their operational tasks through on-the-job experience. CPP's next move is to have a processor upgrade to give an IBM 4300 instruction set.

Efficient

Development and testing takes up 95 per cent of the Magnuson's time, although some batch work is considered as a possibility for the future.

Programmer intervention doesn't usually amount to any more than mounting the tape or getting a quick printout. As it is not a production environment there is no real call for a full-time operator.

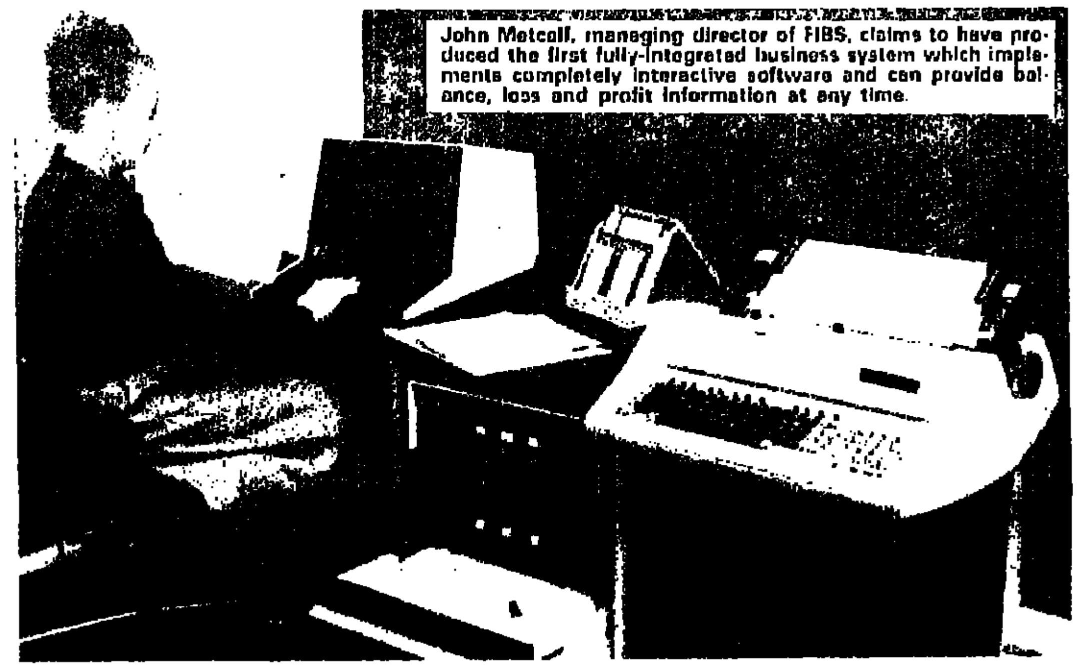
CPP has hit on the most efficient compromise by spreading the responsibilities around and demanding that its programmers understand ops and by appointing an operations supervisor who understands programming.

Gary Turner and John Binns in the computer room at CAP-CPP's site in Richmond, Surrey.

MICRO NEWS

by Eileen Stainer

Hardware picked to fit software



John Metcalf, managing director of FIBS, claims to have produced the first fully-integrated business system which implements completely interactive software and can provide balance, loss and profit information at any time.

IT'S the software that matters now, not the hardware. This point has been made several times over recent months.

System design used to involve the development of a piece of hardware, and following this, software to support the hardware. Now, because hardware design has almost reached perfection capabilities, the roles should be reversing themselves. Hardware must be specified within a system design primarily to support the software.

An example of this theory put into practice is a business system that was launched earlier this year by a newly formed Birmingham-based company called FIBS, Fully Integrated Business Systems (CW, April 3).

John Metcalf, managing director of FIBS, developed his first business system by initially drawing up a flow diagram of the type of software required for business applications, and then choosing hardware that supported it.

Interactive

The high degree of concentration placed on the software development brings it up to a level comparable with the hardware, and together they produce a completely balanced system.

Metcalf's claim is that this is the first time any company in the world has produced totally interactive software packages within a business system. To the user it means that no manual transference of data is necessary, and current situations of profit, loss and balance are available at any time.

At the heart of the software design is a basic rule of auditing: assets plus expenditure must always equal income plus liabilities. For example, to start up a manufacturing business, the company needs to borrow, say, £1,000.

This implies equal liability and asset. When stock is bought, the equation must still be balanced, and Metcalf's business system will perform double-entry book-keeping to ensure that this happens. The sales ledger is linked within the software to the purchasing ledger.

When a job is completed the system automatically reduces the raw material file and increases the finished goods stock file. Stock and work-in-progress are posted automatically as closing stock to the nominal ledger. All the user is required to do is to answer questions and confirm statements in a simple interactive manner. Single-line dialogue is incorporated for simplicity to the user.

The software is supplied in 165 totally interactive programs compiled from Metcalf's flow charts by management consultants Coopers & Lybrand. Written in extended Microsoft Basic, it is stored on five separate discs (four program and one data) and can run on 64K of RAM from any combination of hard or floppy disc drives.

Reliability

At the moment it is a single-user system but FIBS is developing a new package in multi-user Basic to provide a three-user capability.

Thus, the hardware required to support the software has been defined in terms of memory capacity and flexibility. The system must have 64K of RAM and a dual floppy disc drive, and preferably have a hard disc drive and a multi-user capability.

Metcalf made his choice around these specifications with a basic consideration of system reliability.

The hardware system he chose to support his software was the Data Terminal and Communications MK10 microcomputer, which is based on Intel's 8080 8-bit processor and has 64K of user RAM. It incorporates twin floppy drives of 315K-bytes each, with optional one or two 10-megabyte hard disc drives and 8K of system ROM. With three I/O ports it costs £4,576 plus £236 for a fourth. The hard disc drive and interface is an extra £3,042.

Printers

DTC also supplies a range of four printers compatible with the MK10: the 200 RO printer, which costs about £1,700; the 302 RO printer for about another £50; and the 382 T and V printers, which cost about £2,200 and £2,700, respectively. Metcalf chose the Hazeltine 1500 video and keyboard for £765.

Each software package costs £750, making a total of £5,250 for the complete set of seven packages. An optional word processor is available for £250. So a typical price for a complete system is about £15,000. Similar competitive business systems that seem to lack the simplicity and flexibility of the FIBS system are more than double this price (ICL has quoted £35,000). Metcalf sees "very little serious competition" at the moment.

FIBS also provides customers with tailored systems to suit specific requirements for a basic £500 extra per system. According to Metcalf this is very much in demand as there are so many possible applications for the system arising from several existing and new types of businesses. British Leyland is showing interest for its BL Systems network of dealers.

Total service

As it stands the software package comprises such tasks as order entry; stock management, incorporating purchase orders and goods inwards; sales ledger, including sales analysis; purchase ledger; nominal ledger; payroll; and work-in-progress. Disc one takes care of orders, stock and security; disc two, the sales ledger; disc three, the purchase ledger; and disc four, the nominal ledger and the payroll.

To complete the total system service, FIBS provides with every sale a thorough installation and maintenance service. In six weeks the company carries out for the client a pre-survey, a proposal, a final survey and implementation. The latter takes about a week to ten days and involves a consultant being present for questioning during the installation.

FIBS controls the maintenance service by providing a telephone answering service and then running a diagnostic disc through the faulty system to detect the problem area. Any hardware problems are directed to DTC, and software problems, if they occur, to Coopers & Lybrand.

Dealers sought

The type of hardware service provided is an eight-hour response time at a cost of 14 per cent of the system value a year. Metcalf hopes eventually to have one service engineer for every 14 systems installed. Coopers & Lybrand offers a £200 a year insurance back-up service, but this is not recommended in the FIBS package, as the software is parameter driven; and these can be altered.

Metcalf is currently organising a six-branch dealer network throughout the UK. Potential agents are vetted closely and must be able to talk in accountancy language. Reeves Computers of Carmarthen has already been appointed as dealer in Wales, but Metcalf is still looking for dealers to cover Scotland, the North East, the North West, the South and London.

But plans do not stop there. For the future, the FIBS business system will be faster. DTC is about to launch its 8085-based Micro 210, which is fully compatible with the FIBS software, the MK10 and the original Microfile.

Micro 210 will cost £3,000, putting it in direct competition with existing systems in the small business systems market.

Zilog home study

A FIVE-LESSON home study course on Z8000 architecture for the advanced engineer has been introduced by Zilog. It concentrates on the techniques of memory management, methods of interfacing memory and peripherals, proper handling of interrupts and traps and the Z8000 instruction set.

Multi-user CP/M

THE MP/M multi-user version of the operating system CP/M is now available on hard disc for the Cromemco Z2H system from London-based OHM consultancy and software application designer [illegible] Micro Systems. A three [illegible] 10 megabyte hard disc system costs about £6,250.

Plug-in ROM

A PLUG-IN ROM module for Commodore's 32K Pet adds 40 [illegible] commands which enable [illegible] patterns, shapes and diagrams to be produced on the [illegible]. The PICCHIP, available from the Buro Roger Houghton in West Germany, fully exploits the existing capabilities of graphics with the Pet and costs £57.50.

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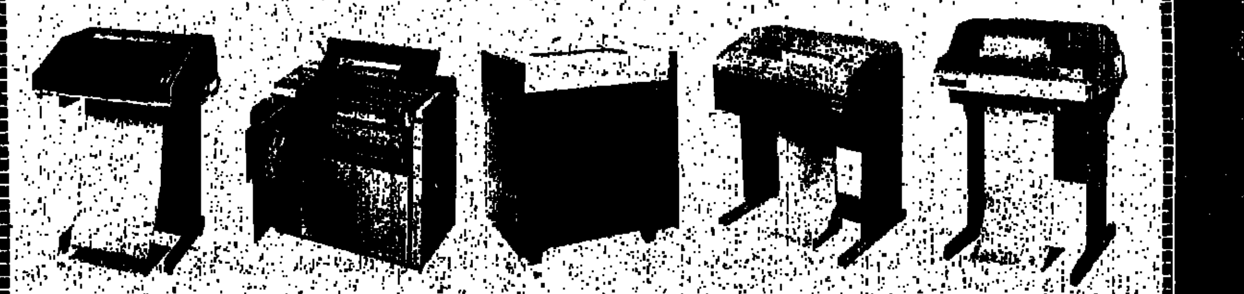

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PEOPLE and EVENTS

IBM names new director of data processing

IBM UK has a new director of data processing. He is Peter Morgan, who succeeds Tony Cleaver. Morgan is returning from IBM Europe, where he was group director of data processing marketing.

Born in Glamorgan and educated at Llandovery College and Trinity Hall, Cambridge, Morgan served in the Royal Signals as a second lieutenant.

In 1959 he joined IBM UK as a sales trainee. He held several line and staff management positions in data processing before being appointed data processing sales director in 1971. He became group director of data processing marketing for IBM Europe in 1975.

Morgan is a member of the Institute of Directors, the British Computer Society and the Institute of Marketing.

David Spicer, divisional manager of Computer Automation's Commercial Systems Division, is shown at the controls of his Piper Comanche 260. Spicer and his co-pilot, Victor Scrivens, have just achieved third place in the Kent Messenger Air Race. This was Spicer's first race, although he has been flying for seven years. The team's next competition is the Kings Cup which takes place on September 20 at RAF Finningly, Yorkshire, and is sponsored by the Daily Telegraph.

BETA jubilee awards

THE Business Equipment Trade Association is to mark its diamond jubilee by making two special awards to the business equipment industry.

Prizes in the Personal section will be £500 for the winner and £300 for the runner-up. The Company award will consist of a trophy and a symbol for the company's use on letterheads, literature and other promotional media.

Entrants for the scheme will be judged on criteria including expansion into new markets overseas, initiative in exports, the provision of trade literature in appropriate foreign languages and the re-design of products or packaging for particular areas.

The awards restricted to members and associate members of the association, will be announced in the spring of 1981.

For further information, contact Richard Harington on: (01) 405 6233.

OCTOBER 21-23:
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Peter Lloyd has joined A&A consultants where he will specialise in executive selection and recruitment in the data processing/word processor sales field. He was previously a divisional manager at Hodge Recruitment.

MD for ITT Semiconductors

LUBO Micic has taken the position of managing director of ITT Semiconductors World Wide. He will be responsible for the company's activities, which encompass 3,500 employees and five plants in the US, France and West Germany.

Micic joined ITT in 1959, after graduating from Belgrade University. His first post was quality control engineer at Intermetall, and in 1967 he became manager of its application laboratory. Between 1968 and 1974 he was product manager responsible for new product development and introduction. From 1974 to 1978 he managed all ITT Semiconductor's sales in Europe as marketing director.

In 1978, Micic was appointed director of marketing and business development for ITT Semiconductors World Wide, assuming the added responsibility of director for Intermetall in 1979.

Gordon Essex has left his post as marketing manager for George Salter and Company, to join the interconnections systems division of Tekdata, as marketing manager.

Golf win for ICL

ICL's golf team tied for first place at the Eastern Regional Final of the Bateman Catering Silver Cup golf tournament, with a team from Norwich Union Insurance.

With an aggregate Stableford score of 92 points over the course at Bury St Edmunds Golf Club, ICL achieved first place by virtue of its score over the last nine holes.

The team members are Frank Ward, a personnel officer, Frederick Mumford, a section leader and Ray Kitchener, an electrician.

ICL has now qualified for the national final which takes place from October 24-26, at Gleneagles Hotel, Scotland.

Winning robot

A PROJECT to design, construct and program a self-contained robot won a prize of £50 for Michael Wynne, a final year student at North Staffordshire Polytechnic.

Wynne's robot was purpose built for the project, and its key component was a Motorola 6800 microprocessor unit. The robot could operate at various speeds, carrying a small payload and was able to follow a dark line on the floor, automatically steering away from walls and obstructions.

The award for the project was given by BIS Applied Systems, to encourage undergraduates in their practical course work.

Two other cash prizes were awarded. The second year prize was won by S Crothers and the first year prize by A Farrall.

John Farthing has been appointed general manager of Geest Minicomputer Systems. He was formerly marketing director for the micro division of ACT.

Roy Hamilton has become sales manager of General Computer Systems UK. He joins from Redifon Computers where he headed its UK field marketing organisation for three years.

Hetherington Honey

PA senior consultant

ALAN Hetherington has been appointed senior consultant with PA Management Consultants. He joined the company in 1977, and is a Fellow of the Institute of Chartered Accountants and an Associate Member of the Institute of Management Consultants.

Tamisie Honey has been appointed to the newly created post of product manager at Advanced Business Technology Inc.

Football tournament

FIVE-A-SIDE football tournament is being organised in the North of England by CPR Consultants and the agency want 32 entrants – 16 each from Leeds and Manchester.

The tournament will be resolved on a group and knock-out basis and there are three titles to be won: Best team in Leeds; best team in Manchester; and the War of the Roses Trophy.

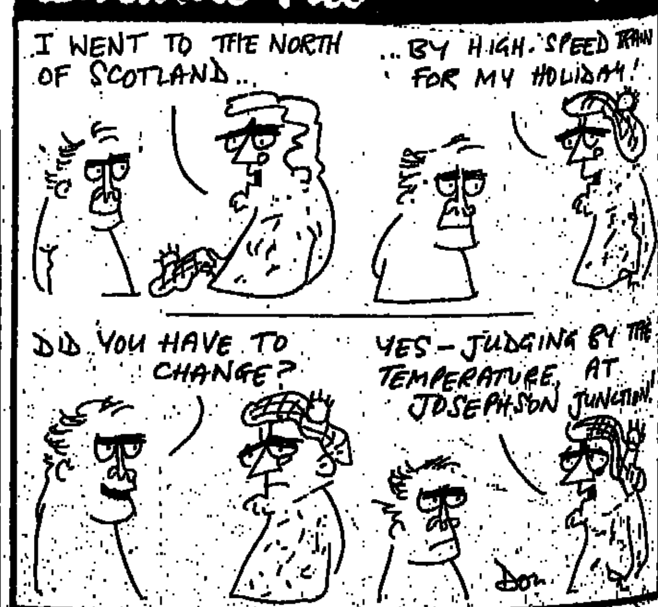
Those interested should contact Ian Bacon, CPR Consultants, 12 Mosley Street, Manchester M2 3AQ. Tel (061) 228 1354.

Data Logic has promoted Richard Slogrove to sales manager in its word processing division, Central London. He joined the company in 1979. Slogrove is a former squadron leader in the RAF, and a member of the Institute of Purchasing and Supply.

Seven months after joining Systime as area sales manager in Bristol, David Packwood has been promoted to regional sales manager.

Liveware File

by Don



DIARY

SEPTEMBER 24
New technologies for information retrieval. BCS Information Retrieval Group, London.

OCTOBER 6-7
Seminar. Digital communications for satellites. Technology Transfer Society (TTS), London. (01) 242 4045.

OCTOBER 9-10
Seminar. Digital communications for satellites. Technology Transfer Society. Amsterdam. (01) 242 4045.

OCTOBER 13-14
Seminar. Digital communications for satellites. Technology Transfer Society. Munich. (01) 242 4045.
Seminar. International technical marketing. Technical Marketing Society of America/TTS, London. (01) 242 4045.

OCTOBER 16-17
Seminar. Digital communications for satellites. Technology Transfer Society. Berlin. (01) 242 4045.

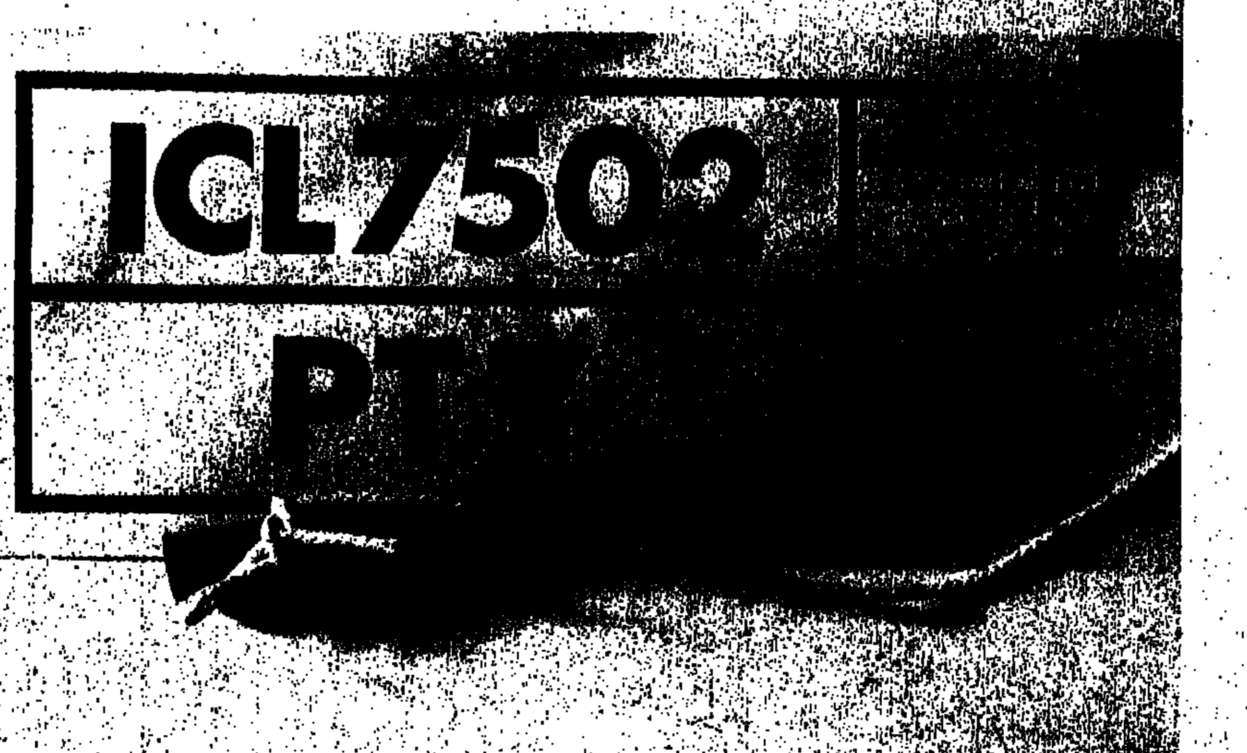
OCTOBER 23-24
Congress. Satellite communication. S[illegible] Association for Communications Research. Munich. Tel: (089) 284909.

OCTOBER 29
Seminar. Project management. British Computer Society. Lanchester Polytechnic, Coventry. Tel: (0203) 24166.

OCTOBER 29-31
Viewdata Exhibition for Professional and Business People. IPC Business. West Centre Hotel, London. Tel: (01) 837 3636.

COMPEC 80 will take place from November 4-6 at Olympia, London. The exhibition is organised by IPC Exhibitions and sponsored by Computer Weekly, Data Processing, Systems International and Practical Computing magazines. Practical Computing will also sponsor Microsystems 81. Compec 80 will display computers, peripherals and systems, and include for the first time an IBM UK stand. Among IBM's exhibits will be the 3101 display terminal.
Further information about Compec 80 and Microsystems 81 can be obtained from Chris Hidwell, Tel: (01) 261 8064.

YOU HAVE A CHOICE.



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FERRANTI Computer Systems

IBM making up lost ground in WP

THE IBM Displaywriter word processor has arrived in the UK less than two months after its US launch. The standalone word processor, built around the Intel 8086 16-bit micro, has a UK base price of £5,000, about 50% higher than the US base price at the present rate of exchange, but still very competitive indeed.

At the same time, IBM's Rolls Royce of shared logic word processors, the 5520 (see picture), based on the processors used in System 34, has been launched a more usual nine months after its US debut.

The two products spearhead IBM's drive to make up lost ground in word processing, particularly in the US, where it is a clear number two to Wang (CW, June 26).

Striking

The elements of the modular system include the display, tiltable 20 degrees and rotatable 30 degrees, separate keyboard, single or dual floppy drive and two printer options: a 15.5 chps golf-ball and 40 or 60 chps daisywheel.

Technically the most striking feature is the 50,000 word dictionary, which by use of an amazing algorithm called Alpha Word Vector chops words up into prefixes, suffixes and particles so that 50,000 words can be crammed into 20K-bytes of main memory. Loadable from a floppy disc and with space for 500 user-defined words, the dictionary is available in English, American, French, German, Italian and Dutch.

Once a document is prepared on the screen, the operator can call up the dictionary which highlights all words which it does not recognise. These will mostly be mis-spellings and proper names, and the operator can go through and correct them and call the dictionary again to ensure they are correct.

It is, of course, only an aid and cannot supplant careful reading through: it will not pick up words omitted altogether or errors like "now" for "not".

The Displaywriter – like the 5520 – has a green display, 25 lines, with facilities to move text forward and back, to copy, to locate a particular word rather than having to find it with the cursor. It does a system checkout on switch-on and puts up the IBM logo when it is ready.

Asynch or bisynch

Printers can be shared by up to three Displaywriters, each of which has to have its own local floppy unit, either 284K-bytes or one megabyte, with a twin floppy option. All the system software goes into the minimum 160K-bytes of main memory, theoretically expandable to a megabyte on the 8086 – so all the floppy space is available for text.

Communications are at present confined to asynchronous or bisynchronous, but SDLC is in the pipeline.

A minimum working configuration costs £5,000 plus £9 a month for any one of the five standard software packages offered, and first deliveries are set for February 1981.

Attractive

The 5520 is not user programmable, but the 5525 controller uses processor hardware based on that of System 34. Disc space extends to 130 megabytes.

It is internally a true SNA device, although bisynch is also supported. It takes up to 18 workstations; up to 12 printers, all of which at present have to be 5258 ink-jet printers, based on the 6640 from the Office System 6, although the latter is not directly attachable; and up to 16 communications lines.

It is an attractive system for electronic mail, featuring store and forward, auto call, auto answer, distribution lists, priority and particular time of day letter dispatch and delivery confirmation.

Although it is an SNA device, using SDLC internally, only limited support is given for access to databases on IBM host mainframes under IMS or CICS.

Communication is also supported with the 6670 intelligent copier.

Most noteworthy feature of the 5520 from the user point of view is the extraordinarily comprehensive set of prompts which are available to explain to the operator exactly how to use the machine.

These run to 2,500 screen pages which can be called up at the press of the "help" button.

Since the only printer available is the ink-jet, the operator is able to call up a wide variety of type styles and spaces from the workstation. In general this would involve changing the wheel on a daisywheel printer.

Next year

The 5520 is by no means cheap: a system with 29 megabytes on disc, four workstations, and one printer costs £46,000. No software prices are given. First deliveries are set for the second quarter of next year, and an additional files processing facility will be available in October 1981.

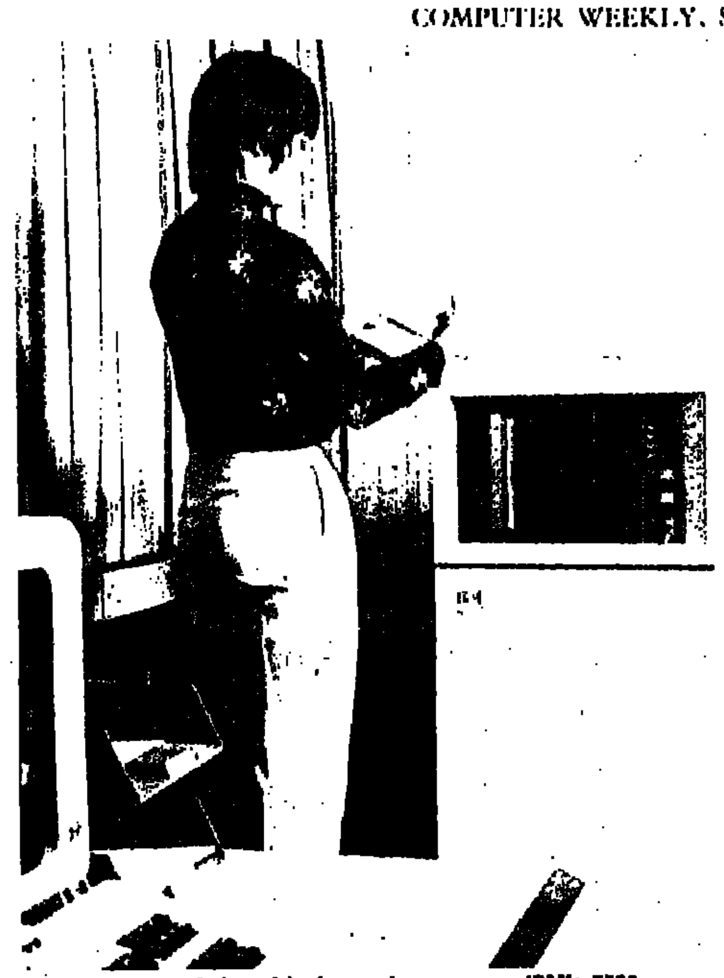
IBM has also now made its Statement of Direction on word processing in the UK.

This says that over the next three years, freedom to mix and match the word processing products from the Office Systems, General Systems and Data Processing Divisions will regularly be improved. Salesmen are to be encouraged to propose the most appropriate solution to each customer regardless of which division supplies it.

Opportunity

The 5520 and the Displaywriter already support a magnetic card unit compatible with the cards used on IBM's magnetic card typewriters, and the Displaywriter can be used as a terminal to the 5520, but only through a communications port.

The statement gives users the opportunity to press the company to provide what they really want: it is unsatisfactory that while the 5520 is clearly a more attractive word processor than the 3730 from DPD and is a true SNA device, users who want to manipulate data on the 370 host under, say, TSO have to choose the 3730 – or run the software on an 8100 under the DPCX operating system.



The Rolls Royce of shared logic word processors, IBM's 5520.

Ferranti in VMOS deal with US firm

FERRANTI Electronics has signed an agreement with Supertex Inc of California to manufacture VMOS power field effect transistors.

These discrete devices will use a planar vertical VMOS structure, a design approach which eliminates problems created by V and U groove techniques. Electric fields at the bottom of the grooves limit breakdown voltage performance.

Application areas include microprocessor and logic interfacing where VMOS high power gain allows direct interfacing to high current/high voltage loads, switching power supplies and power output stages for audio frequency amplifiers.

Ferranti's Brian Down says, "The company has a commitment and intention to stay in discretes." According to a recent report, where the American designer will use a big chip, the European counterpart will try to optimise by using the full range of available products.

Mailbox service

EUROPE'S first publicly available international mailbox service is being launched this week by Service 800, the international toll-free telephone service provider. This will enable mobile businessmen to deposit and collect messages, irrespective of office hours, via a portable terminal and a phone call to Switzerland.

Called DataMail, the service is based on the Comet mailbox software written and used in the US by Computer Corporation of America. It is operated under licence by Radio-Suisse, the Swiss international record carrier, using the Digital Equipment PDP-11/70 at its telecommunications centre in Berne.

Service 800 has the worldwide marketing rights and is demonstrating it this week at Siccab in [illegible] and the Security Industry Association seminar in New York.

Users are supplied with a portable matrix-printer terminal, with a built-in acoustic coupler more than twice the size of a portable typewriter for depositing, collecting and manipulating messages.

Radio-Suisse plans to have pocket terminals later, as well as worldwide radio pagers with digital clocks to record the time of the first message.

Datac

Swiss users use the same access point for DataMail as for the Datac database access service based on the Data-Link Service packet switching node which connects to Tymnet and Telenet in the US and Datapac and Infoswitch in Canada.

DataMail can be accessed from North America via these networks.

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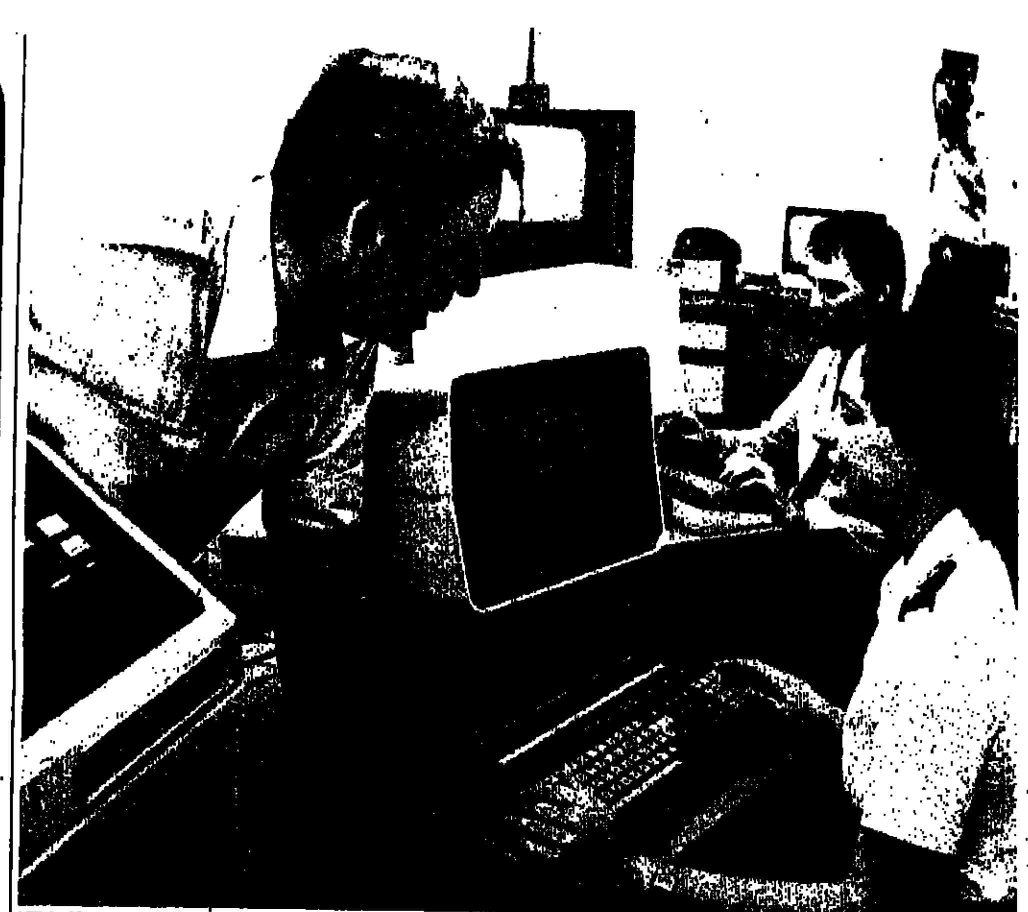

This ICL ME29 workstation is used as an input/output and inquiry terminal for the Salome (depot self-sufficiency) system. A viewdata terminal is in the background.

Companies come to the aid of the Army's intelligence

by Paul Fisher

GROUCHO MARX once commented that military intelligence is a contradiction in terms.

The Directorate of Supply and Computer Services, DSCS, of the Royal Army Ordnance Corps wants to spend over £1 million to prove that the remark is not true so far as the military's computer intelligence is concerned.

The DSCS has been staging a ten-day demonstration, named Ocelot (Operational Control Environment for Logistic and Office Tasks), to show off the capabilities of existing computer power and to prove that further expenditure is justified. The exercise brings together ten inter-related management information projects which are designed to cope with normal and emergency supply procedures.

Thin budgets

Although the overall military budget has been increased by 3 per cent in real terms, individual units find they have to convince MoD top brass of a scheme's validity before any money is forthcoming. Additionally, there is a three-month moratorium on military expenditure which still has two months to run.

Brigadier Lawrence, of the DSCS, says: "Expense budgets these days are thin. Therefore we try to test out the practicality of our systems before putting any proposals to central government."

Ocelot is a demonstration of such a proposal. What is remarkable about it is that it largely being staged with borrowed equipment. Whether in a spirit of unbridled generosity, or due to a judgment that orders will eventually be placed, ICL, Systems Production of Farnborough and Radio Rentals have loaned the Army a considerable amount of equipment in support of Exercise Ocelot.

To secure a contract worth £1 million at list prices ICL has lent £120,000 of hardware. This includes two 7502 cluster display terminals, six VDUs and two 7700 word processors which are used for the production of briefs and reports and the screening of charts. An ME29 computer provides a viewdata service (on Radio Rental TVs) and also runs a stock control system called Salome.

Salome would come into action in the event of a major computer breakdown or communication failure. It holds details of 117,000 vehicles on its database, although for the purpose of Ocelot between 15,000 and 20,000 of the Army's classified vehicles are not included.

Four of the Ocelot demonstrations, with the acronyms Snoopy, Silver, Astrid and Roland, are supported by a mainframe site three and a half miles away from the DSCS Graven Hill headquarters at Arncott. The site has two ICL 1900s, a 1906A for classified information and a 1904S.

Of particular interest to commercial users is the Astrid demonstration. It works in conjunction with a TP monitor to access and update information concerning ammunition components in real time.

Much of Ocelot is using the £8.5 million Crusader exercise as a backdrop. It is supposed, for the purpose of some demonstrations, that a ten-wagon train carrying ammunition has exploded near a place called Bad Brecht. Thus, for example, Astrid is able to identify possible causes for the accident.

Boring

There are two supporting demonstrations code-named Coffer and Safari. Coffer is a rugged mobile system using £30,000 worth of equipment loaned from Systems Production Ltd. It deals with the movement of stores required by a division in the field. In the words of Lt-Col Bewley, who is heading the project, such a task is "clerically intensive and boring".

The project will use the processor from Systems Production, Winchester storage and fibre optic links.

Pending central government's approval, all the Ocelot schemes will be operational within the next financial year. The scope of the demonstration and the speed with which it had been mounted was impressive. To take one example, 135K of Cobol code was prepared in three weeks by a military programmer for the Coffer demonstration. The Arncott database will be easily accessible which would be vital should an emergency arise.

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DEC MF11U 16k Word Core and Backplane	£1,000
DEC MM11U 16k Word Core Add In Memory for MF11	£600
DEC TU10 9 Track and 7 Track Slave Tape Transports in Cabinets	£1,500
New RP06 200 Mb Disk Drives Single and Dual Ported. Ex-Stock	£16,750
New RM03 67 Mb Disk Drives Ex-Stock	£9,500
Refurbished Memorex 660. 20Mb Disk Drives (RP02 Compatible) (Controllers Available)	£2,500
Refurbished C.D.C. 9746 40 Mb Disk Drives (RP03 Compatible) (Controllers Available)	£3,500
DRICO Cartridge Disk Drive (RK05 Compatible) (Controllers Available) 2.4 Mb	£1,750
4.8 Mb	£2,000
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DEC RX211BD Controller and Dual Drive	£2,300
DEC BA11KF Expansion Box	£1,700
DEC DB11A Bus Repeater	£1,040
DEC M9312 Bootstrap	£400
DEC DL11W Serial Interface	£450
DEC LA120 DECwriter III	£1,550
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7755 F100 Visual Display Unit (VT100 Compatible)	£1,050
Centronics 702 Front Feed Serial Printer	£2,750
7741 F120 K.S.R. Printer Terminal	£1,450
7602 700 cps Paper Tape Reader with PDP 11 Interface	£1,500
7660 Paper Tape Station 700 cps Reader, 70 cps Punch with PDP 11 Interface	£3,500

FUNGUS also have a large selection of disc storage sub systems ranging from 2.4 Mb to 256 Mb configurations. Phone now for further details.

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This is the biggest battery in Britain....

WITH 415 cells, the largest battery to be installed in Britain has been commissioned at the National Westminster Bank's computer centre in Kegworth, Leicestershire.

The £100,000 Chloride Alcad battery is part of an uninterruptible power supply from Anton Piller of Cirencester, Gloucestershire. The battery is able to support all the centre's essential functions for five minutes until auxiliary generators are brought on to full load.

The National Westminster's Kegworth centre houses three IBM 370/168s which run a number of applications including branch accounting.

Canada feels slighted by British Telecom announcement

CANADA'S Department of Communications has complained to British Telecom about its announcement on the adoption by CCITT of the UK's Prestel and France's Teletel viewdata systems as international standards (CW, July 3).

The DC said the announcement implied that Canada's Telidon system had been ignored.

Replying for British telecom, deputy managing director John Whyte told the DoC in a telex message that they had misunderstood the press release and denied that it contained any errors of fact.

Whyte said that two standards had been adopted for alpha-mosaic systems, but under alpha-geometric systems Telidon had been cited as an example. He pointed out that as Telidon had not been proved in the field it had not been subjected to the same degree of scrutiny by the many experts participating in the Montreal meeting where the standards were adopted.

There was a clear inference that alternative schemes may be considered.

In contrast, 10 telecommunications administrations had adopted Prestel-type coding schemes for their viewdata trials or services.

The DC has asked the Canadian government for 50 million dollars to market Telidon at home. Last year, 9 million dollars was awarded for research and demonstration projects.

Database access

WEST Germany's Bildschirmtext viewdata system is due to extend its market trial at the end of this month to include access to privately operated databases, following delivery of computer networking software providing X25 and IBM 3270 communications' protocols developed by Systems Designers to run on the GEC 4082s in Dusseldorf and Berlin.

Extended

CLYDESDALE Bank plans to extend its Autobank online banking service to include all of the bank's 350 branches. Autobank provides 24-hour online banking via teller units linked to eight computer centres.

Part of the SWTP hardware for the ABIES patient recording system (see story, right).

Helping the GP with his work

A PATIENT recording system for general practitioners that should help them ensure that regular treatment is always carried out when needed, has been launched by ABIES Informatics, using South West Technical Products hardware. Optional extras include word processing and the Mickie patient interviewing system devised at the National Physical Laboratory.

The ABIES system does not record the doctor's notes, but keeps registration details and acts as an index to the written files. In addition, up to 64 "characteristics" for each patient are recorded by the doctor on a card, detailing certain diseases and conditions that need to be checked regularly. These are entered by a secretary into the system, and automatic reminders are then produced.

Doctor pays

The smallest configuration, with floppy disc storage for 6,000 patients, costs £6,000, and a system with hard disc, daisy-wheel printer and Mickie costs £9,500 and has capacity for 65,000 patients.

Future facilities will include a prescribing system which will print out and keep track of prescriptions, and "event recording" to help analyse a GP's workload and provide data on the spread of diseases.

The purpose of the system, according to Tim Benson of ABIES, is to help the doctor with his work, not to save money, as clerical staff are largely paid for by the Health Service. The equipment would have to be paid for by the GPs themselves.

Mickie is being sold under licence from the NPL (CW, June 12). The WP package is Autotext, already in use with SWTP micros.

Upgrading to NCR I-8430

THE Bristol-based JT Group is planning a move from its current NCR I-8250 to the more hefty I-8430. Delivery of the £113,000 package is scheduled for October 1 and the system is expected to be running by mid-December.

The JT Group is a construction company which also owns five residential country clubs. It uses DEC PDP equipment for computer-aided design work and NCR equipment for administration and finance.

The I-8430 has a 512K memory as opposed to the 128K of the 8250. It will take on accounting and contract costing and handling 25,000 club members' records.

Upgrade work will be dealt with in-house using NCR conversion programs. John Provan of the JT Group reckons that conversion should take an average of half an hour per program. "It's a simple migration," he says.

System that speeds up courts' administration

CRIMINALS in and around the Oxford area are finding life much harder and the strong arm of the law even stronger these days.

Oxford Magistrates' Court has installed an Allied Business Systems Police and Magistrates' Courts Computer System to speed up the administration of criminal cases.

Based on the ABS Multibus minicomputer, the system controls the entire administrative process, from booking the defendant at the police station to his eventual processing in court and the enforcement and collection of any fines.

The system at Oxford Magistrates' Court cost £80,000 and has seven terminals, two of which are in the police administration office and five in the court building.

Information about the defendant and alleged offences is entered by police and court staff on a question-and-answer basis and may be updated at any time up to the day of the hearing.

After the hearing, court staff enter adjudications via the terminals. Fine notices, court orders and adjournment notices are printed, and credit and debit accounting details are set up.

The various types of account — fines, fees, maintenance and so on — are held by reference number or name, and money received is allocated far more quickly than on a manual system.

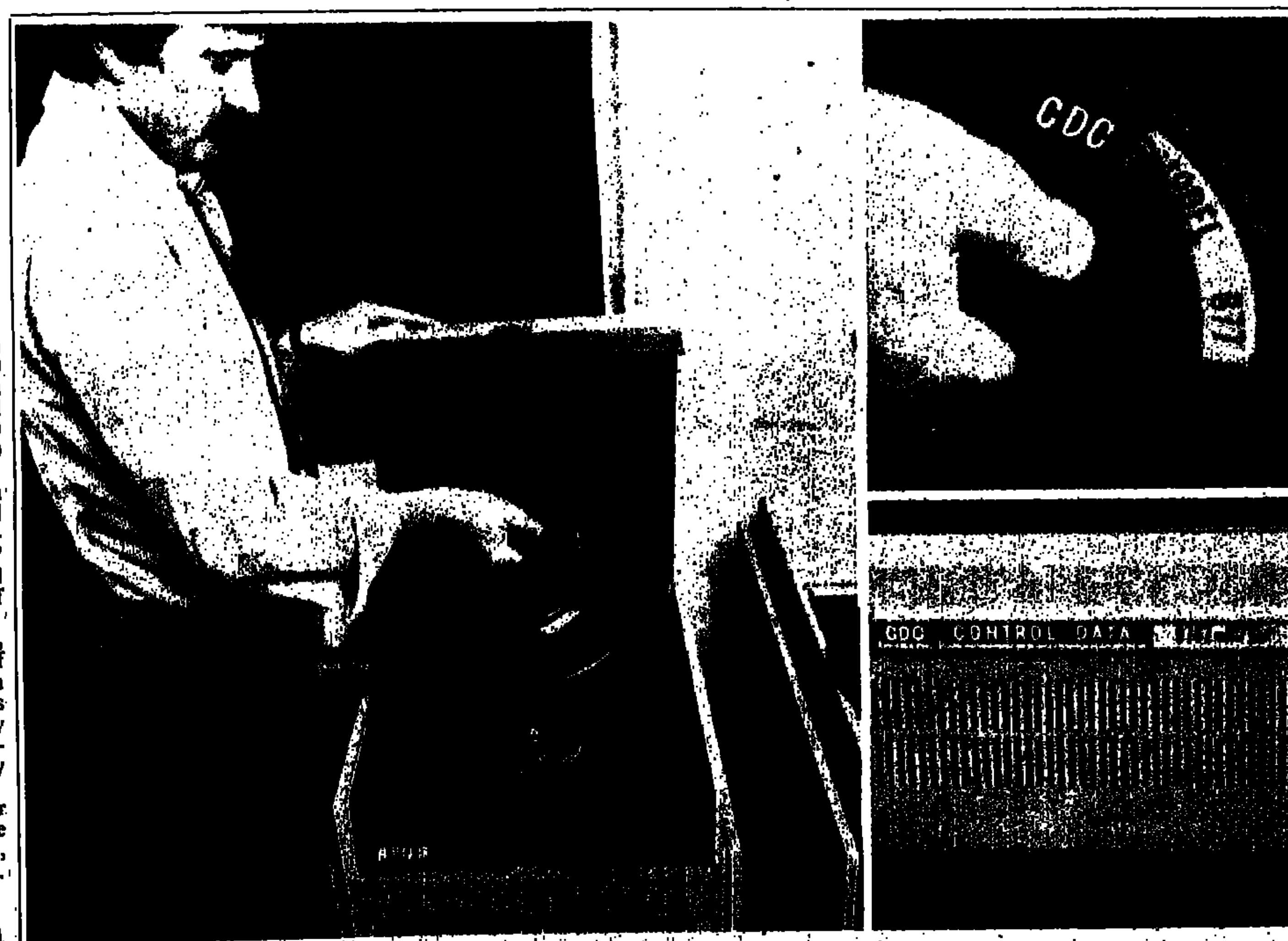
Bunzl denial

BUNZL Data Systems of Leighton Buzzard, Bedfordshire, has asked us to point out that it has registered no interest in Isher-Woods and has made no bid to their liquidators, Robson-Taylor, for the assets of this or any other company.

In our issue of September 4, we named Bunzl as one of three companies interested in Isher-Woods, which has now been acquired by HB Computers of Kettering (CW, September 11).

Yearbook

THE Council for Mutual Economic Assistance (Comecon) 1979 Statistical Yearbook is available for £25 from IPC Business Press, 40 Bowling Green Lane, London EC1 0NE. Tel: 01-837 3636.



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COMPANY NEWS

Controlling the money supply not enough

THE government's long-term economic strategy is beginning to look like a reflection of the hoary old chestnut about the Irishman who, when asked the way to an abtruse destination, advised, "If you want to get there, sorr, I wouldn't start from here."

The policy to control the money supply is clearly working – perhaps rather too fiercely and rather too well on the private

COMMENT

sector, but the overall aim, which is to get inflation down to low single figures, looks as far off as ever it did.

The most significant single element which is pushing in the opposite direction is the public sector, as telecommunications users, commuters and anyone who has to pay a gas or electricity bill knows to his cost.

Private sector price rises, whether directly as a result of government policy or simply as a result of the recession, are moderating rapidly, and anyone in the fortunate position of having any spare cash can have a field day in the high street.

But because the most nationalised industries can only remain solvent by either increasing the money supply by adding to government debt, or putting up their prices, the government's strategy insists that they have to do the latter. Yet the public utilities represent such a substantial element of the retail price index, which although inadequate is the only measure we have of inflation, that their price rises can cancel out the best efforts of the private sector.

Few people would now deny that nationalisation of steel and shipbuilding were monumental mistakes from almost any viewpoint, making the task of government of whatever complexion well-nigh impossible.

Until the Post Office, the public utilities and industries like shipbuilding, steel and so forth are operating like genuine commercial organisations, the "experiment" with monetarism is bound to appear to fall without ever having had a genuine test.

Delta sets up firm in Brussels

Delta Data Systems, the programmable display terminal manufacturer, has set up a subsidiary based in Brussels to cover the Benelux countries. Called Delta Data Systems Benelux SA, the subsidiary is Delta's first in Continental Europe and will concentrate initially on selling the Delta 2830 which emulates Burroughs TD830 displays with additional features.

The 2830 has been chosen as the first product mainly because its installation does not require systems assistance for the customer. In addition there is a high level of demand for the 2830 because it can be supplied immediately.

The Benelux subsidiary is currently being provided with full technical, commercial and marketing support by the Delta Data Systems UK subsidiary.

Delta is still represented in the rest of the Continent by distributors, although Delta has long-term plans to set up subsidiary companies in France, West Germany and other countries.

New broom at Centronics

IN the wake of disappointing results for its financial year ended June 30, printer manufacturer Centronics is undergoing substantial re-organisation at the hands of Michael Kaufman, the man who took over as president in April. But Kaufman has not touched the Centronics organisation in Europe which now accounts for about 40% of total worldwide turnover and which provided most of the profits in the last fiscal year.

Former Xerox Corp executive Kaufman has named six new vice presidents, three of them being men brought in from Raytheon and Xerox to fill the new positions of senior vice president of operations, senior VP finance and VP of planning.

In addition, Kaufman has divided the company into three product-based groups. They are the microcomputer printer division, which embraces the 100 chps 80-column 730 series launched a year ago, industrial printers, which covers the faster, more expensive units used with minicomputers, and the Quietwriter division which is devoted to the innovative low-speed word processor printer first described last year (CW, November 29, 1979). Quietwriter employs a stylus print head which forms characters in a similar way to writing with a pen. It should be launched in the first half of next year, probably at the National Computing Conference in Chicago in May.

Centronics is also developing faster printers for the word processing market, employing print heads with a high density matrix.

Centronics figures for the year ended June 30 include net profits slightly down on the previous year at $18 million and sales up 8% to around $130 million. The company's dull performance has been blamed on technical problems with the 730 series printers which forced Centronics in the US to close down the production line for these units for a period of about six weeks earlier this year. In addition, the US side of the company is burdened with most of the cost of developing products like Quietwriter.

Production of 730 series units now stands at 350 a week and this year's projected total output figure is 75,000.

The industrial printer division manufactures the 700 series of high speed matrix units and the 6000 band printer family which incorporates print mechanism built in Japan by Hitachi.

Kode aims at £10m turnover

ANNOUNCING gross profits of £662,405 on a turnover of £4.62 million for the first 24 weeks of 1980, Kode International says that it is confident that its turnover will top the £10 million mark this year.

But according to a company spokesman the capital goods division of Kode which builds and sells computer terminal equipment has now been overtaken in turnover by the components division. The latter consists of PC board manufacturer Kam Circuits, and military equipment builder Moore Reed.

The capital goods division comprises Kode Ltd and Kode Services and a major source of its revenues now is the XL/40 multi-terminal key-to-disc system built in the US by Pertec. The Datavet data entry system built by Kode itself at its factory at Calne, Wiltshire, is being phased out.

But the Kode spokesman said that no more redundancies at Calne were likely following the 20 staff that were shed earlier this year (CW, March 13) because there was still plenty of work for the remaining personnel. Some of them were still involved in building card punches and a lot were busy extensively modifying the Teletype ASR43 matrix printer terminals that Kode supplies to the Department of Health and Social Security. In addition there was the customising of XL/40 systems to suit individual customers.

Kam Circuits, which is also based at Calne, is now the fastest growing part of Kode International. It manufactures PC boards for customers that include Plessey, GEC and the Post Office and many computer companies with manufacturing operations in the UK. Kam is setting up a multi-layer PC board production line similar to the ICL operation in Manchester (CW, June 26) only on a smaller scale.

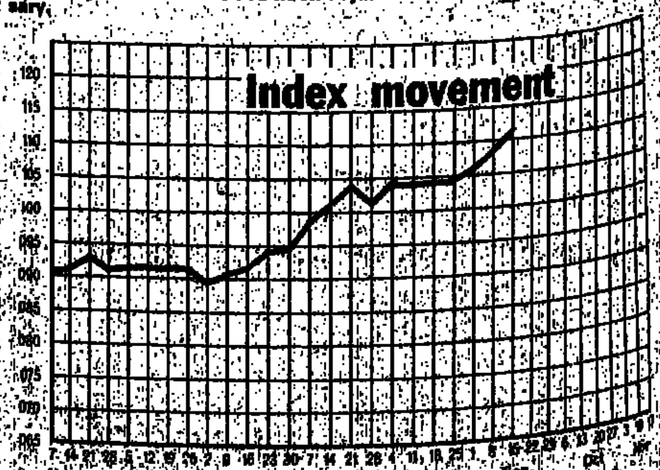
CW SHARES TABLE

Date: 12/9/80 Index: 111.79 Change: +2.88

Pence 1980 High	Pence 1980 Low	London Stock Exchange Stock	Pence Price	Pence C'nge
516	230	A Comp Tech (25p)	515	-52
43	28	B Bev Kent (25p)	30	– ¾
£37	£28⅛	Burroughs ($5)	£27⅞	+£⅞
78	41	Chloride (25p)	42	– 2
120	84	Chubb (20p)	84	– 4
108	70	Cole (R.H.) (25p)	70	–
875	640	De La Rue (25p)	875	+90
180	148	Exel (25p)	165	–
490	234	Ferranti (50p)	490	+43
537	235	GEC (25p)	537	+39
£43⅛	£30⅝	Honeywell ($1.50)	£37½	–£ ½
£31	£23	IBM ($1.25)	£27½	–£ ⅛
191	116	ICL (25p)	181	+ 9
81	54	Kalamazoo (10p)	78	–
322	203	Kode Inter (25p)	322	+40
£26¼	£20⅛	Motorola ($3)	£24⅝	+£ ½
270	102	Muirhead (25p)	147	– 1
£111	£76	NCR 4% 83/98	£95	–£3
£194	£125	Perkin-Elmer 4%	£188	–£9
470	388	Philips Lamp (Fl 10)	388	–10
268	108	Plessey (50p)	268	+26
341	109	Racal Elect (25p)	341	+32
104	65	Rediffusion (25p)	104	+ 7
£13½	£10⅜	Rockwell ($1)	£12⅞	+£ ⅛
£68⅛	£40⅞	Schlumberger ($1)	£60⅝	+£2⅛
£26⅛	£18¼	Sperry Corp ($0.50)	£21⅝	–£ ⅞
£21	£16⅛	TRW Inc ($1.25)	£19⅛	+£ ¼
374	287	Thorn-EMI (25p)	360	–14
£26¼	£21⅛	Xerox ($1)	£25¼	–£ ⅛

$ 1980 High	$ 1980 Low	New York Stock Exchange Stock	$ Price	$ Cng
23¼	19⅝	AM International	[illegible]	[illegible]
27⅝	17¾	Ampex	[illegible]	[illegible]
49⅞	33¼	Automatic Data Proc	[illegible]	[illegible]
84	62⅜	Burroughs	[illegible]	[illegible]
27⅞	16⅝	Computer Sciences	[illegible]	[illegible]
74¼	45	Control Data	[illegible]	[illegible]
98	59½	Digital Equipment	[illegible]	[illegible]
48	29⅜	Harris	[illegible]	[illegible]
76¼	63⅜	Hewlett-Packard	[illegible]	[illegible]
87⅝	68¼	Honeywell	[illegible]	[illegible]
92¼	68¼	Intel	[illegible]	[illegible]
68⅝	51⅛	IBM	[illegible]	[illegible]
18⅞	11½	Memorex	[illegible]	[illegible]
61⅞	42¼	Motorola	[illegible]	[illegible]
39⅝	17¼	National Semi	[illegible]	[illegible]
78⅛	63¼	NCR	[illegible]	[illegible]
59	37	Perkin-Elmer	31	[illegible]
31	[illegible]	Rockwell Inter	[illegible]	[illegible]
147¼	85	Schlumberger	[illegible]	[illegible]
65¼	47⅜	Sperry Corp	[illegible]	[illegible]
21	13¼	Storage Tech	[illegible]	[illegible]
74½	28⅜	Tandy	42	[illegible]
70	43⅜	Tektronix	[illegible]	[illegible]
126¼	66⅜	Texas Instruments	[illegible]	[illegible]
48	28	TRW	[illegible]	[illegible]
16⅞	8¼	Wyly	[illegible]	[illegible]
68½	50⅛	Xerox	[illegible]	[illegible]

The table shows the closing prices in London and New York at the end of last week. The share index is based on the prices of the UK companies in the table. Highs and Lows have been adjusted for capital issues where necessary.



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The need to discover ways of improving the circulation of medical data, especially "know-how", was the main conclusion of Fourth International Congress on Medical Librarianship held in Belgrade this month. Attended by over 600 people, it was concerned with DP as well as medicine and library science.

Impressive results from Third World

by Josip Rajman

UNDER the heading Health Information for a Developing World, the Fourth International Congress on Medical Librarianship attracted over 600 participants from 56 countries to Belgrade this month.

It was notable for the diversity and quality of the 120 papers presented and for its interdisciplinary nature, being dominated as much by informatics as by medicine and library science.

Dr. I. Margan, the Yugoslav Deputy Premier, who is himself a doctor of medicine, opened the Congress, together with representatives of the World Health Organisation, Unesco and various related organisations and officials of the Yugoslav health agencies and the city of Belgrade – most of which were also its sponsors.

A section on new technology and computerised databases included the following papers:

2,200 users

J. C. Blair (US) gave a comprehensive run-down on the selection of hardware and consideration of software in the medical DP information services. He also gave a financial evaluation of time sharing compared with in-house facilities.

K. G. Kilgour (US) described the Online Computerised Library Network, OCLN, with 3,200 VDUs serving 2,200 users. The network uses eight Sigma 9 computers, three medium-sized Tandem computers and 49 minicomputers and disc units with a nominal capacity of 12,000 million characters.

Three-quarters of the participating institutions are integrated in the system, and the remaining quarter, which account for only 5 per cent of the whole activity, use various dialling procedures. The Health Science Section of the system comprised 168 medical libraries on March 1.

Hospital

The cost of an integrated terminal hour is only 50 cents. Seventy million location listings were attached to 6.25 million records at April 1980.

R. Medenica, a Yugoslav medical expert working in Switzerland, spoke on the role of informatics and a computerised system in a modern hospital. Full details were given of the system in the University Hospital in Geneva where two million people are being medically recorded and where full data can be kept on about 10,000 inpatients. The configuration consists of minicomputers and terminals, and covers a range of information from "face to face" data on specific patients to the basic medical achievement records. Cost of installation was about 40 million Swiss Francs.

Yoshio Amano reported on the trends in databases for medical literature in Japan, where of over 2,000 medical journals, 1,660 are now covered. After an analysis he summarised 10 conclusions to be followed in the future development of medical databases in Japan.

P. S. Gooch (UK) from the Commonwealth Agricultural Bureau Database gave a contribution on environmental and nutritional medicine with useful tables.

Poorest

It was normally expected that professionals from developed countries would have more to say about technical achievements. But there were many reports from developing countries, sometimes from even the poorest ones, which described the great efforts that are being made, and even the first impressive results.

Often material from such countries is as valuable as that from industrialised states, for in developing countries the situations are more similar and sometimes simply the lack of financial means leads to new intelligent solutions.

There were valuable reports from India, Bangladesh, Cameroons and Papua New Guinea, on the activity centring around data processing and the desire to achieve the most up-to-date technology.

The reports of the representatives of Czechoslovakia, Hungary and the USSR were of special interest as the medical information services were designed to cover the whole country in each case.

Twelve Yugoslavian experts gave a picture of developments in this country, which is now also connected to the largest medical information bases. The Ljubljana Medical School, connected online to the West German DIMDI-net in Cologne, has access to 15 further databases (including Medline) with over 10 million references of which a half comprise abstracts.

I. Lukic of Yugoslavia submitted a paper on the role of microfilm in speeding up the retrieval of medical documentation.

Medlar III online (Medline) was one of the top items in many ways at the Congress. J. Leiter (US) told the audience how it works, based on two IBM 370/168s. Medline was also the main subject at one of the three seminars accompanying the Congress.

Conclusions at the Congress centred on ways of improving the circulation of medical information, especially know-how to assist developing countries. The developed countries are encouraged to help developing countries with inter-library loans at subsidised prices, until the latter are able to satisfy at least 80 per cent of demands from their national resources.

In the final discussions many British, American, Canadian, French and German librarians expressed the wish to co-operate with institutions and individual colleges from developing countries, forming so-called "twin libraries" (one library from a developed country and one from a developing country).

The African Association of Medical Informators was established on the last day of the Congress. It is the first association of this kind at a regional level, and resembles in this the World Health Organisation.

Photo: S. Lozar, Belgrade

Yugoslavia's Deputy Premier, Dr. I. Margan, giving the opening speech at the Congress in Belgrade.

ANNOUNCEMENT

Some earlier models of Anadex DP-9500 and DP-9501 printers may exhibit an operating error when used in the serial mode at high baud rates, resulting in possible loss of characters or incorrect horizontal tabulation.

A change in the printer software to eliminate this error was incorporated at S/N D006670 for the DP-9500 and S/N D003311 for the DP-9501.

Any owners of earlier printers who are experiencing this problem should contact their supplier who will fit a modified EPROM at no charge.

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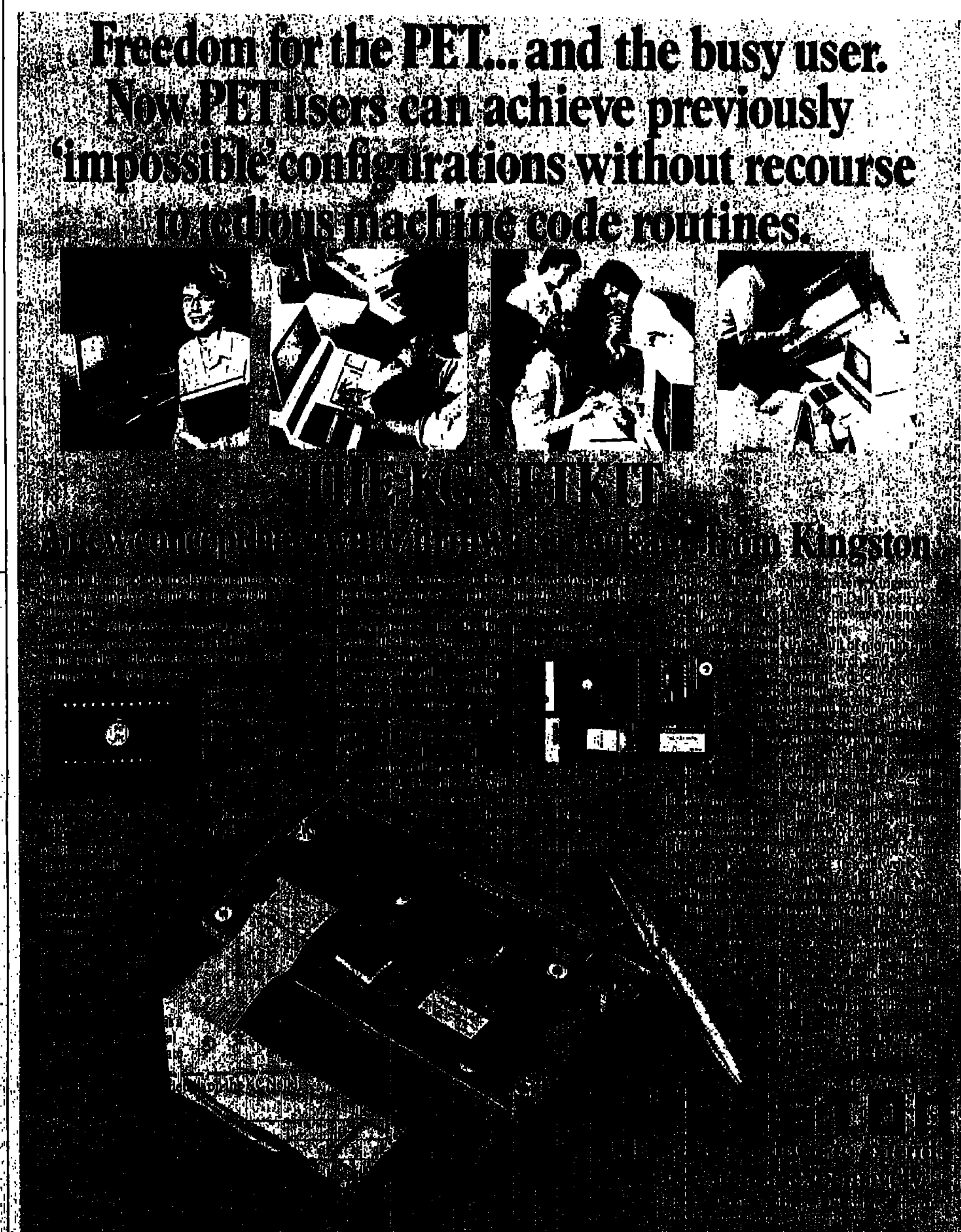

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Datapro/Computer Weekly user survey . . . Report by Tim Palmer

Honeywell top of the poll at UK mainframe sites

Honeywell comes out the clear winner in the first UK Datapro survey of user satisfaction, with an overall rating of 3.21 out of 4. At the other end of the scale, Burroughs and NCR get a clear thumbs down from users, with ratings of 2.77 and 2.75 respectively. However, while user dissatisfaction with Burroughs is clear-cut in the detailed questioning, NCR's position is anomalous, since the survey points up no obvious failings in its performance.

Second in the list is Digital Equipment, rated 3.00 by the six UK DECsystem-10 users who responded, but IBM is close behind with 2.99. The only other companies represented, ICL and Univac, tie for fourth place with 2.89.

The significance of the figures should not be exaggerated: in the US, Amdahl topped the last Datapro poll on user satisfaction, but in the UK, no Amdahl or Itel sites responded to the questionnaire. Some of the sample sizes are also unsatisfactorily small: NCR's low rating is an amalgam of the views of 19 users, while DEC's high rating comes from only six.

Another difficulty with the survey is that it contains a substantial amount of history: five Honeywell 2000 users, four IBM 360 users, eight with ICL System 4 and nine with NCR Centuries are included.

A striking feature of the survey is that whether a company gets an overall good or poor rating, technical support is universally marked severely. Only two machines rate a 3.0: the ICL 2956 for documentation, and the IBM 370/115 for user education. That contrasts with a 2.2 rating for education on the 145. Few people will be surprised that Burroughs comes an emphatic bottom in this section, as the company has a wide-spread reputation for poor support, and rates low in this section in the US, too.

HONEYWELL'S name at the top of the overall user satisfaction league will not come as much surprise. Honeywell users in the UK tend to be loyal to and complimentary about the company, and it gives an overall subjective impression of being among the best of the UK subsidiaries of US companies.

Responses were received by 35 users, 15 with Level 66, 15 with Level 64 and five with H2000s.

Happiest were the Level 66 users, who gave the machine a satisfaction rating of 3.4 — the highest for any model in the survey. All 30 of the 64 and 66 users would recommend the machine to another customer. The H2000 users rather distort the survey since it is a defunct machine.

Level 66 users give a 2.9 for trouble-shooting — a high rating in terms of the survey as a whole, and all three lines rate high on ease of operation and reliability. Maintenance rates particularly high: 3.2 on the 2000, 3.35 on Level 66 and 2.95 on Level 64. The GCOS 66 and GCOS 64 operating systems rated very high: 3.5 and 3.2 respectively.

A little surprisingly, perhaps, four of the five H2000 users would recommend the machine to another user; it is not quite a museum piece, but would only be found in the used computer lots.

Perhaps Honeywell's biggest failing is in proposing systems too small for the user's requirements: one-third of Level 66 and more than a quarter of Level 64 users accuse the company of this — an across-the-board rating only worse in the case of Burroughs, which is dramatically the most given to this sin.

Delivery

Digital Equipment brought in responses from six DECsystem-10 users, who were the second most satisfied — yet only three of them would recommend the machine to another user. One had problems with late delivery of hardware and software, and one found keeping up with DEC's enhancements difficult.

The DECsystem-10 got the second highest rating for any machine in the survey for ease of operation, 3.5 out of four, but bad marks — 2.5 — for reliability. DEC's technical support was also rated poorly: 2.3 on troubleshooting and 2.5 on education. At 2.7, DEC got one of the lowest ratings for maintenance.

The operating system was highly regarded at 3.3; compilers and application programs were average. Ease of programming rated 3.2.

IBM, with an overall satisfaction rating of 2.9, came third in the survey. Responses came from 112 users, four with 360s, seven with 370/115s, 14 with 125s, eight with 135s, 32 with 138s, 13 with 145s, 10 with 148s, eight with 158s, 11 with 3031s and five with either 3032s or 3033s. Classifying the last two together is a little misleading since the 3032 was a stopgap which has already been superseded by the 3033-N, whereas the 3033 still has some life ahead as a current product. There are also nine 4331 users in the survey.

The 135 and 145 are the only machines which stand out as having significant irritations: several users rated both machines excessively noisy and expensive in terms of power and cooling. A couple of 148 users complained that IBM proposed too small a configuration, and that system costs were higher than anticipated.

Most enthusiastic are the nine 4331 users: the machine gets a 78% rating on response time and 11% — one user! — found the machine cost less than he expected. Two 3031 users were also pleasantly surprised at the cost.

Three of the nine 4331 users complained that the software was late and one felt misled by IBM on how compatible the system would be with existing software.

The 3031 stands out among current IBM machines as the only one with a rating below 3.0 on ease of operation: users rated this 2.7.

Satisfaction

The 370/148 scores an amazing 4.0 out of four for reliability — unique in any category in the survey; only NCR comes anywhere near IBM on overall reliability rating, and all the IBM machines rate well above 3 except the 158 which gets 3.0, and the 360s — but that is to be expected.

IBM maintenance rates above average to good, but its technical support was rated average to poor — but then no manufacturer scored highly in this section.

User satisfaction with IBM's operating systems increases at the top and bottom ends: mid-range users, presumably plodding along with VS/1, are least happy. IBM's applications programs reach only a 3.0 rating on the 3032 and 3033 — only five users all told — but then no-one else does any better.

Most users would recommend another customer to buy the same system — two 360 users even recommend their machines, which seems a little odd in 1980 — but 125, 135 and 148 users are noticeably less enthusiastic, and there is clearly one 3031 user who is not at all happy.

Surprise

ICL, equal fourth with Univac in the survey, is represented by 118 users: eight have System 4, 71 have 1900s, 16 have 2950s, five have 2956, 14 have 2960s and four have either 2970s or 2980s.

It is easy to pounce on the figures from the last four users to castigate ICL, but everyone ought to know by now that these machines initially performed so poorly that they were inadequate for the tasks they were asked to handle. Everyone knows too that the software was very late, and so the only real surprise is that two of the four users are now happy enough that they would recommend the machines to others.

Turning to the mainstream of the ICL section, only the 2956 users are happy that the power they were proposed meets their requirements — but two complained of late software delivery.

The important machines in the survey, since there are no 2972s, 2976s or 2982s, are the three mid-range ones. All three rate over 3.0 for ease of operation, but ICL reliability overall is clearly still inadequate: only the 2950 rates above 3.0 for the current machines and the peripherals are even worse. All the other vendors bar Burroughs do better in this category.

Sadly, too, although ICL maintenance is well up with the average for responsiveness, it is rated even less effective than Burroughs'.

However, ICL's technical support — trouble-shooting, education and documentation — come out near the top of a low-rated section. Overall only Honeywell scores as well in this section.

There are two disgruntled users of 2956s, but otherwise the users of the latest ICL machines are generally happy to recommend them to others, with the 2960, which had some substantial teething troubles, getting the highest user satisfaction rating — 3.1 — and the most enthusiastic testimonials.

Shaky

The two unhappy 2956 users plan to dump their machines this year for another manufacturer, and of the 35 1900 users planning to upgrade this year, 16 will stay with ICL and 17 will defect. The rest are staying put. ICL's System 4 base looks decidedly shaky: two will move up to DMB/4 or VME/B, but three are defecting. One of the 16 2950 users also plans to leave the fold.

Univac users rank equal fourth with ICL users — but there are only 20 of them in the survey: 11 with 90/30s, three with 90/60 or 90/70s, and six with 1100s.

Support

There is a sharp divide in the markets served by these two ranges, and 1100 users are overall much happier than those with 90/30s.

Univac clearly oversold the 90/30: five of the users who responded, 45%, said the company proposed a machine too small for their requirements and three got a nasty surprise when they added up the bills. Univac's maintenance comes out better than anyone apart from NCR, but the company's technical support is way down with the poor average for the survey.

Disgruntled 90/30 users spoil Univac's average — but as there are only 11 users of this machine in the survey, the sample is too small to be significant and the six 1100 users are generous with their marking and unanimous that they would tell their friends about it. The only problem which stands out is that two sites found its power consumption and cooling requirements excessive — but they could well be users of the old 1108 or 1110, which are obsolete.

It is easy to see why Burroughs users are dissatisfied, much less so NCR users.

NCR is represented by 19 users, but half still have the obsolete Century machines, so that the view of NCR's modern machines is based on only nine responses — scarcely statistically significant.

Puzzling

There are four 8400 and five 8500 users in the survey, and the low rating for overall satisfaction is puzzling, since in no section does NCR rate conspicuously badly. It rates much better than ICL or Univac on ease of operation and reliability, its maintenance is only just behind Univac and Honeywell, it is a little below average on technical support, but better in this regard than Univac, and the company's software is overall rated at about the same as IBM's.

Only two Century users are planning to defect to a competitor this year; four will upgrade with NCR, and the rest plan to stay where they are. The four 8400 users would recommend the machine, and only one of the five 8500 users would not.

So where is NCR falling down?

Undeserved

The survey results strongly suggest that the company does not deserve its apparent bottom place in satisfaction rating.

Burroughs is represented by 37 users, nine with B1700s, three with B2700s, five with B3700s, nine with B1800s, three with B2800s and eight with "other models".

Unlike NCR's case, it is crystal clear why Burroughs gets its low rating. Almost half of those who responded, 17 users, accuse the company of proposing a system too small for their requirements — and this is as bad among users of the newest machines as the older ones.

The company's technical support figures are abysmal and look like the marks for a skater who fell over three times and didn't complete his programme. There are only three users who rate Burroughs' technical support above 2.0, and the lowest mark, 1.3, in the whole survey comes from the five B3700 users for education.

Apart from the 15 sets of marks between 1.3 and 1.8 on Burroughs' technical support, only one other company gets a mark below 2.0 in this section, and that is NCR with a 1.8 for its documentation on the defunct Century machines. Yet one of the newest Burroughs machines, the B1800, rates 1.6 for trouble shooting, 1.8 for education and a shameful 1.8 for documentation.

One in four NCR users complained of late hardware delivery; three in five Burroughs users from a sample almost twice the size complained of late hardware delivery. The company also beats ICL on lateness of software — particularly on the newest models in the survey.

Ambiguous

Surprisingly with a modern machine, one of the B2800 users found power consumption excessive.

Burroughs maintenance is rated about average, and, in line with the company's reputation, when the hardware and software do arrive, they are generally good: hardware gets a rating comparable with that for IBM, while the company scores top marks in the survey for its operating systems, compilers and applications programs.

Five users only plan to defect this year, but nine of the 37 would not recommend their machines to another user; ICL 1900 users who would not recommend are much more numerous — but in their case the question is particularly ambiguous: no-one is going to install a new 1900, but moving to 2900 under DME is a different question, not covered by the one posed, which is, "Would you recommend system to another user?"

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Disappearance of the office as we know it

. . . BY the Middle Ages the middle-men of commerce, the merchants, had set up permanent dark and dirty little offices. Here the clerks and apprentices, who often lived in, recorded the transactions of goods that they never saw.

What has this to do with automation? you may say. But in an age when control of the human intelligence of the employee was autocratic and precise, and the response servile and uncomplaining, was this much different from much expected of the current microelectronic proposals? The ensuing innovations, such as printing, blotting paper, fountain pens and pencils; and developing practices, bank notes and banking, insurance, broking, underwriting and so on were part of the expansion of offices. Office jobs were created rather than lost.

In any case the white collar workers, as they came to be known, had even less pretensions to solidarity and corporate power than their manual colleagues. Even the humblest clerk saw himself as an individual. Whatever the innovation, there was no Luddite reaction.

Assimilated

So the age of efficient postal services came, the cheap penny post, regular deliveries and letters and parcels delivered to all parts of the world.

The typewriters, ladies who could type, arrived not without some male chauvinist reaction, but were assimilated over 20 to 30 years. The telephone and teleprinter introduced instant communication, but in conjunction with the postal service, better transport, wireless and newspapers they also encouraged the mass, monolithic reaction.

The growth of trade unionism in the offices has been slow compared with that of their factory colleagues, but it needs to be reckoned with in future.

So we arrive at the last 25 years, dominated by the television and the computer. The traditional balance of developments arising gradually from needs has been upset over the last five years or so. Developments are now seeking markets and it is impossible to predict whether this will be a permanent trend. Since the manufacturing interests behind these are very powerful and the potential gains from sales are immense, effective choice is passing out of the hands of the user, be he the employer or the employee.

Apprehensive

Popular demands, engendered by high pressure advertising, are encouraging the use of techniques without adequate appraisal of economic or social consequences. The influx of cheap computing is already making inroads into the numbers of accounts and cost clerks, and may affect accountants.

The current burning issue is word processing. Trade unions are apprehensive and many employees have not and do not wish to acquire the necessary skills. Employers like the idea in principle and there have certainly been great savings in staff time, but will the ultimate effect be gain or loss?

It depends on how broadly this is judged. There are already signs that office workers are becoming more cohesive and that office unions and associations are becoming more powerful and more militant. They will not be able to stop the method being introduced but they can obstruct and if necessary abuse its use.

The practical implications of office automation was the subject of the Institute of Data Processing Management/Langton essay competition for 1980. This week we feature extracts from the second and third prize-winning essays. F. BOEUF of Abbots Langley in Hertfordshire, who won £100, foresees the emergence of Luddite trade unions, computer-aided computer fraud and a working population of machines. DAVID REED of CAP-CPP, whose prize was £50, describes a world of cottage workers, who leave their homes only to go on holiday.

Fragmentation

Computer fraud for personal gain is now a fairly well-established crime, albeit somewhat difficult to detect, and the politically motivated corruption of computer files is just as feasible. At present the overall effects are marginal, but with a trade recession, other traditionally more backward countries doing their own thing often more efficiently with better equipment, and higher unemployment, what will be the impact in the next few years?

Telephone linking of conference rooms now allows meetings to be grouped at two places rather than one. This has so far not had any appreciable effect on office workers, but with closed circuit television one can expect to see the beginnings of fragmentation of the larger offices.

This trend can be expected to accelerate, given the high cost of office space and the cost and difficulty of commuter travel. Lightweight "paging" equipment allows the office worker, in common with everyone else, the freedom to move around while still retaining communicability provided that there is always a convenient telephone available. Now that restrictions on local broadcasting are being loosened, if not entirely removed, this must mean more use of totally portable, coat-pocket telephones.

Hand-held terminals allow the keying in and storage of "on-site" data, ready for telephone transmission to the computer. These will further extend the "walls" of the office when they are sufficiently developed to be used for general commercial purposes.

The office of the future may well become something of a battlefield between conflicting interests, with the word "office" either disappearing or changing to a less precise, non-locational meaning.

At the core one might expect to see a primary, controlling computer, sited to suit prestige or defence considerations with satellite microcomputer terminals in homes or in single person sub-offices. There is no reason why the sub-offices should be more than modest sized cubicles provided on the same basis as telephone boxes by the Post Office or hired out hourly, daily or as is needed, by private firms.

Mobile offices

Data input options will be various; speech, keying in, or RAM. The transmission could include, as well as data and speech transmission, closed circuit TV.

Since weight and wires are an impediment to portability, the first will be reduced to a minimum, the second dispensed with altogether, using one or other of the various carrier wave possibilities. This will allow vehicles to act as travelling offices or in more limited circumstances for the human walking office.

On the reverse side, some of the employees will be attempting and probably attaining various kinds and degrees of frauds, secure in the knowledge that the powerful white collar unions to which by this time all "office" workers will belong, will certainly provide strong support. Cheating the computer is so impersonal that it could become an occupational disease, or an occupation itself depending on how you look at it.

[But] given the mania for collecting information that will undoubtedly arise, how do you prove that this or that set of it has been pirated or misused?

There are two possibilities. Either malfeasance is made impossible, ie the computer system is unbreakable, or the wrong-doing is monitored and detected. In both cases the same computer could undertake security and in larger systems a dedicated machine could be used. On the one hand, one would expect security problems to be more easily solved as computer intelligence increases. On the other there is a possibility of equally intelligent computers being used to break into the system. With further intelligence, computers can correspond with each other in such a way that human intervention is virtually eliminated.

It is certain that more and more data is going to be collected and communicated. In theory the growing army of unemployed could be re-employed collecting it or assimilating it. In practice there will be more and more automatic collection of data, and there is no reason why there should not be automatic assimilation and an increasing amount of intelligent process control.

New language

Is there scope for a new concept, an international machine language which is recognisable and most suited to machine intelligence? It would seem that, having removed the present concept of the office as a physically located and confined entity and replaced it with something more tenuous and universal, it is probable that many if not all of its "workers" will be machines and not people. There are some years of "progress" ahead before this can happen. There will certainly be years of labour resistance which will delay but not stop the process.

Devolution must come

THE office has been to the twentieth century what the mill was to the nineteenth or the cornfield to earlier times; the place that many people go to most hours of most days of most weeks. Not that the office is a novelty — justices and merchants had them long before the moneychangers' headquarters were Lobbed from the Temple — but it has needed this century to turn the office into a way of life for millions . . .

It must be almost impossible to say anything original about communication as more has been written about the subject in the last quarter of a century than about politics or sex. Suffice it to say that all office systems were originally designed to communicate, and the desire of people to communicate with each other aids, distorts and impedes the intended processes . . .

Nothing new

While the designers and salesmen try to persuade everyone that office automation is the latest thing — and the office worker fears that this may be true — the existing elements of office systems need to show their track records . . .

Today's telex machine strongly resembles that of World War Two. Data transmission networks between computers (or between computers and terminals) have been operating for a dozen or more years. Facsimile transmission goes back 20 years and microfilm or microfiche much longer — neither has exactly swept the market.

The automatic typewriter driven by a magnetic card or a paper tape (or two) is at least a decade old and the visual display unit, whilst of the same vintage, can claim little progress in its development life.

Perhaps the only real office equipment revolution was the dry copier which arrived some 20 years ago, was an instant success and has changed a whole set of habits in typing, distribution and duplicating. And even that is regarded in some quarters only as an example of people getting something because it became easily available. The contrast between the number of copies in the first month of installation and the seventh month still tends to stun many buyers of these devices.

The telephone has advanced somewhat, eg in pushbutton selection, but the features that really please the user are Keep Trying Bad Respondents and, above all, Transfer Incoming Calls to Someone Else. All useful progressions from the handcranked instrument but still defying integration with paper-, word- and data-processing systems.

These components of office automation are not new. The buyers are asked to believe, however, that by wiring some of the components together (with a powerful processor and one or two new devices) a whole new integrated office automation system is about to emerge . . .

Going home

But a kind of office automation revolution is taking place and, more significantly, has to take place. The process will reverse the people flow of the industrial revolution and might well become known as the commercial devolution — the workers are going home to the cottages whence they came.

It is not difficult to envisage the cottage worker in his dwelling. Equipped with a telephone, a visual display screen, a keyboard and a printing device, he can carry out almost all the functions which he previously did in his office. The savings made in his time and cost of not travelling to work may well suffice to compensate him for working at home, leaving the saving in office provision to help fund the equipment needed to support him in his new location . . .

Mobility

Apart from the domestic and leisure advantages and the ability for people to schedule their own work much more than hitherto, there are greater advantages with staff mobility than are currently possible. A worker can easily move to a new job since the location of his "firm" is totally irrelevant to his place of work, which of course remains constant.

As to setting up this highly distributed processing system, each village or community would have a large aerial equipped with boosters, communications controllers, storage devices, and other technophilia. Each dwelling in the village would be wired to the aerial complex as houses presently are via lines to telegraph poles. Each aerial would be in line-of-sight with one or two other aerials, enabling a total communications grid at frequencies of VHF or above to operate satisfactorily between any two points in the country.

Some of the results of dispersing the office function to the home need to be examined. First, the railways would be reduced to carrying mainly freight and engaging in a little tourist traffic. The amount of business travel would be reduced to an absolute minimum. The resultant energy saving would be very significant.

The roads would also carry mainly freight, but the secondary users would be sightseers and holiday-makers. An enormous saving of petroleum products could be envisaged; this would of course mean the car industry constructing only freight carriers, from the 40-ton articulated vehicle down to the "mini-truck". Private cars, being used almost exclusively for holidays, would probably become a rental item only.

The post office mail service for carrying letters would disappear completely and only the services required to carry parcels not already ready covered by mini-truck branch systems would remain. It follows that the concept of the original document would also disappear, and many documents would exist only in mass storage until copies were printed or the originally stored document was purged.

Management's role

These can only be examples of the many secondary results, but one worth mentioning as a final point would be the change in the role of management. Managers and supervisors accustomed to having people at their beck and call would still be able to communicate by voice, visually and by document with their staff.

However, psychologists are quick to point out that communication with people remotely removes important elements such as body language, and however faithfully the visual aids operate bringing life size images of staff and management face to face in the same room (apparently) there will clearly have to be major temperamental adjustments in the new situation.

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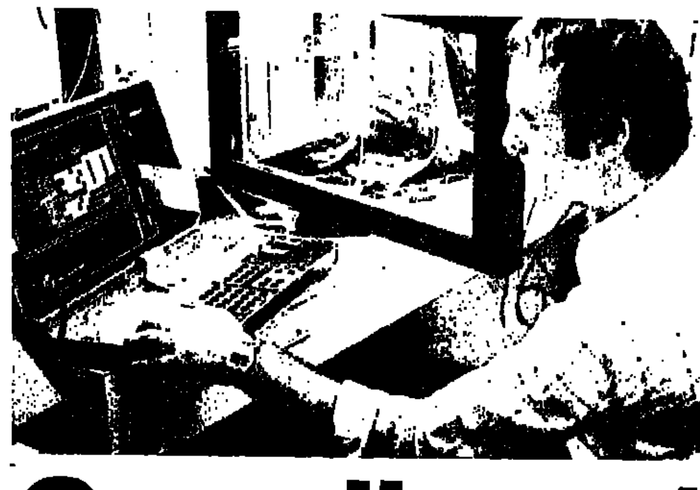
To the average Southerner Newcastle-upon-Tyne probably means coal, unemployment and the famous "Broon" ale.

Software File Editor CLAIRE GOODING went to an exhibition to celebrate the city's first 900 years. Called Newcastle 900, it aimed to show that, while the above view is not entirely wrong, it misses out quite a lot.

Newcastle is a city addicted to "firsts" — its elegant Georgian streets were the first to be lit by electricity, thanks to Swan. In the last century, Stephenson, Armstrong and Palmer were among the local lads and this helped to make Geordie land one of the UK's strongest industrial areas.

One hundred years later, Newcastle is still trying to regain its leadership by welcoming new technology with open arms. This is proved by projects like the Byker Wall housing development which is heated by a waste reclamation plant, and the local electric railway service, the Metro, which not only brought work to the area but also re-opened to passengers lines closed by Dr Beeching.



Despite failing in its bid to win an Inmos factory, Newcastle is still keeping abreast of computer developments. Here, at the Gas Board's engineering research station at Killingworth, where local lad George Stephenson used to work at the pit, micro processor-based systems are tested at the station's electronics and instrumental laboratory.

Geordies utilise old and new skills

PROGRESS is more important than history for the Geordies. Who else would have built a railway almost through the middle of a castle built in 1080?

To celebrate its 900th birthday, Newcastle is, as ever, looking forward rather than back with an exhibition of energy and engineering in the Eighties at the university campus. It was called Newcastle 900.

There is evidently no shortage of lively minds and creative skills. Encouraged by the council, new enterprises are springing up which draw on Newcastle's traditional skills such as heavy engineering and mining to combine them with the new technology.

British Gas has several establishments in the North East, including the Engineering Research Station in Killingworth.

"We are constantly seeking new ways of tying in microprocessor technology with existing engineering skills," said Colin Duncan of British Gas's External Services.

Micro-engineering is being developed for applications such as monitoring the performance of valves which control the flow of gas through pipes.

The systems feed essential maintenance information back to engineers so that they can effectively govern such factors as gas pressure from one central point.

Success

Other successful projects include the On Line Inspection Centre at Cramlington, which uses microelectronics to inspect 10,000 miles of high-pressure gas pipelines.

On a smaller scale, there are developments such as the Gascopact, a hand-held device about the size of a briefcase which is about to undergo field trials. In its triangular bottom half three sensors give an accurate detection of underground pipes — a development which would be highly saleable elesewhere.

British Gas is proud of its readiness to take up microprocessor technology, and it has no regrets about choosing the North East. The land was available, and the support for development was on offer. Most important was the pool of technical skills there for the picking.

The cultural and academic side of Newcastle has always been closely tied in with its livelihood. More than one University department has links with local industry, and they are eager to pass on enthusiasm for computers.

Its Chemical Engineering Department plays a particularly active role in passing on state-of-the-art computer expertise. It has developed its own extensive system of minis and micros as well as using the computing laboratory's IBM 370.

Varsity's bid to spread the word

IN a bid to teach local firms how to use computer techniques, Newcastle University's Chemical Engineering Department took part in the Newcastle 900 exhibition.

The department had several applications on display at the exhibition which illustrated process control, computer aided design and word processing — Dr Julian Morris' students use the latter to produce their thesis!

It has also developed its own database on chemical properties, based on a Cromemco System III. Other projects such as the micro-controlled monitoring of acid in the output of effluent into rivers have won the interest of industry.

Using a Digital Equipment PDP-11 — also used for graphics — and Zilog's Z80-based MCZ-1, the department has developed a system which "teaches itself".

The system uses a self-tuning control algorithm to allow a distillation column to respond to environmental changes. The project was started six years ago and was the result of several PhD theses. It has been tested in Canada and the department is hoping for a first customer, probably a local chemical firm.

Plenty of home-grown software products

THE North East has largely been ignored by the big national software house but there were plenty of locals with home-grown products on offer at Newcastle 900.

On show were several small enterprises eager to provide computer expertise to the longer established concerns: heavy engineering, pharmaceuticals/chemicals and breweries.

They included Real Time Systems, a South Shields firm set up by ex-university staff; System 800 which has produced its own business system; and North East Electronics, which specialises in micros in industrial control.

In an area which prides itself on its tradition despite hard times, small local firms are likely to win large local custom. The Geordies have ever been an independent lot who champion hard-working enterprise.

Tyne and Wear certainly does not appear to be discouraged by the failure to get an Inmos factory. The local Small Business Club sees DP as one of the most promising development areas and counts several software and hardware firms among its members.

The city has already proved that it is not frightened of putting money into ambitious projects. Since it lies within a Special Development Area it can offer financial and other aid to firms settling there.

Newcastle-upon-Tyne has certainly done its best to shed the out-of-date grimy image. If it doesn't regain its one-time glory on the strength of the new technology, it won't be for want of trying.

Helping local firms to adapt to micro technology

IN Newcastle's Jesmond Road there is another example of academic/commercial co-operation. The Micro-electronic Applications Research Institute is an unusual alliance of the city's Polytechnic, the university and one of the UK's largest software houses, CAP-CPP, with extensive funding from Tyne and Wear County Council.

On display at Newcastle 900, MARI had examples of how it tries to help businesses adapt to micro technology.

Marvin, a system developed for a client to monitor hazards in offices and factories, uses an Apple II. The Apple uses sensors placed around the premises, and if there is a failure of any sort will give an early warning. A screen diagram indicates the safest escape route from the building in case of fire, or invisible hazards like radiation or poisonous gases.

MARI is also involved in teaching engineers and business people how micros can assist them. One project on show, developed with a local firm, was used by a local school to monitor results of laboratory experiments.

Involved

The RT80 laboratory system was designed and built for use in teaching and research. The user has immediate access through a front panel so that data lines can be connected with experimental apparatus.

MARI is also involved in process control, automated testing of components and a whole range of industrial applications for microelectronics, including a robotic project with a small engineering company.

About 80 per cent of MARI's projects are with local companies, large and small.

On the move

A TRAINING centre for users of online information retrieval services is to be opened in London this month by the magazine Online Review Terminals, and visual aids will be available.

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SO SUCCESSFUL was the 1980 Peripherals Suppliers' Exhibition, that the organisers have had to make it bigger in every way for 1981.

MORE TIME — An extra day, three instead of two. Attendance in 1980 was treble that of the previous year and in the opinion of the exhibitors the *RIGHT* people attended.

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. . . AND IF YOU THOUGHT THAT WE HAD FORGOTTEN TO RUN THE STEEPLECHASE, YOU ARE IN FOR A DISAPPOINTMENT!

It's so tight as Viv strikes gold

THE finals of Computastars started off with a series of bangs on Saturday at the New Alexander Stadium, Perry Bar, Birmingham. The surprise event was pistol shooting – just the thing for hangovers.

Organiser Gordon Cairns said: "They're calling me the JR of Computastars. No-one expected it – it was a bolt from the blue." This event also threw up one or two surprises: the winner of the men's events in this section was Piet Walraven of Swets en Zeitlinger from Holland, who said he had never fired a gun before!

While there was plenty of competitive spirit from competitors such as Geoff Linnell of Data Logic and Martin Rigby of Rowntree Mackintosh, in the men's individual events it was Viv Oliver of Safe Computing who came through to take the gold.

The ladies had the closest competition though. First place honours were shared by Bridget Cuthill (Legal & General) and Lucy Baines (United Biscuits) with 79 points each. Despite the fact that they were neck and neck most of the day, there was always a threat at some stage from the other girls in the top 12 placings.

Third place went to Anne Shafto of Rowntree Mackintosh who has featured in the honours in previous years.

In the men's individual events, no less than three competitors tied for overall second place. They were Geoff Linnell (Data Logic), Dave Cross (National Provident) and Piet Walraven (Swets en Zeitlinger).

Up until the last event Viv Oliver of Safe Computing was just in the lead by one point. Then team captains started to look at the scoreboard and realised that they could share the honours if something a bit extra could be pulled out of the hat.

Many competitors must also have regretted not getting more points earlier on in the day.

So it was left to the steeplechase – always a crowd-puller – to sort out the men from the boys, so to speak.

As Father Time was advancing, the organisers decided to reduce the distance to one lap of 400 metres – but this did not stop the usual number of competitors taking an early bath.

All this did not deter Viv Oliver from giving his best. As most of the competitors were down for this event, no-one knew who would be the overall winner – it was just a case of going as fast as one could.

Viv also scooped the Computastars Tankard for being the top international sportsman at the finals.

There was also plenty of action in the gym events. Despite it being a test of muscular endurance, competitors were in fine vocal form as well.

Mick Jones, 24, a systems analyst with Data Logic at Manchester, said: "It was awful. We drew lots for this (event) and I lost." He did manage 15 push-ups though.

INDIVIDUAL RESULTS

Best lady: Bridget Cuthill (Legal & General) jointly with Lucy Baines (United Biscuits) both with 79 points; 3, Anne Shafto (Rowntree Mackintosh), 75; and 4, Louise Cotter (Segas), 72.

Best man: Viv Oliver (Safe Computing), 75 points; 2, Geoff Linnell (Data Logic) jointly with Dave Cross (National Provident), both with 73 points; and 4, Paul Ellis (Midland Household Stores), 70.

Best international lady: Bridget Cuthill (Legal & General) jointly with Lucy Baines (United Biscuits), both with 79 points; 3, Anne Shafto (Rowntree Mackintosh), 75; and 4, Louise Cotter (Segas), 72.

Best international man: Viv Oliver (Safe Computing), 75 points; 2, Geoff Linnell (Data Logic) jointly with Dave Cross (National Provident) and Piet Walraven (Swets en Zeitlinger), all with 73; and 5, Paul Ellis (Midland Household Stores).

LEFT – There was a tie for first place in the UK Ladies individual events. Computer Weekly editor Simon Timm presents medals to (from right) Bridget Cuthill of Legal & General, Lucy Baines of United Biscuits and Anne Shafto of Rowntree Mackintosh.

Bridget and Lucy will share the Computer Weekly Rose Bowl for six months each.

Simon also presented medals for UK men's events and judged the Computartist competition.

RIGHT – the fourth event was a football dribbling relay. This consisted of each team member dribbling a ball through three hoops and then shooting for goal. The next person could not start until the previous one had scored. Here Johan Brouwer of Digital Equipment I (based at Utrecht) demonstrates his skills.

BELOW – In the 400 metres hurdles relay, team captains could decide where to place the change-overs. Here Rowntree Mackintosh's Martin Rigby overtakes ARC's Chris de Bont.

The Dutch teams [illegible] to Computastars. There were separate awards for them and in the men's [illegible] Swets en Zeitlinger (left) with ARC third.

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Piet shoots his way to victory

FOR the first time Computastars went international with a strong Dutch contingent – with the likelihood of further countries entering next year.

There were separate awards for the Dutch teams, who were also eligible for the international awards.

Over 170 competitors and their supporters flew over from Holland on Friday evening to take part or cheer. The Continental contingent gave the finals a flavour of It's a Knock-out with the whistles, horns and clapping.

Despite leaving a contingent at their hotel, the Dutch were among the keenest sportsmen and women there. At 9:30 most of them were seen warming up and training for the event with the enthusiasm that would have brought a tear to a sergeant-major's eye.

Yet the star of the Dutch contingent must be Piet Walraven of Swets en Zeitlinger who tied for second place overall with Geoff Linnell of Data Logic and Dave Cross of National Provident.

His efforts were a great help to his team and undoubtedly contributed to the Swets team coming in at No. 8.

A natural athlete, Piet was modest about his performance. His best result was the pistol shooting, though his own preferences were in athletics.

The Dutch also seemed to push themselves hardest. At least four Dutch girls had to go for medical treatment after their races.

In the individual events, only a few points separated the top 12 girls with Corrie Rost van Tonningen of Control Data being the highest placed Dutch girl with 61 points and ninth overall. Second highest placed Dutch girl was Wilma v. Montfoort of Crediet en Effectenbank with 69 and in 12th place overall.

● Adi Coyajee, publisher of the Dutch weekly magazine Computable, invited the competitors over to Holland for next year's finals.

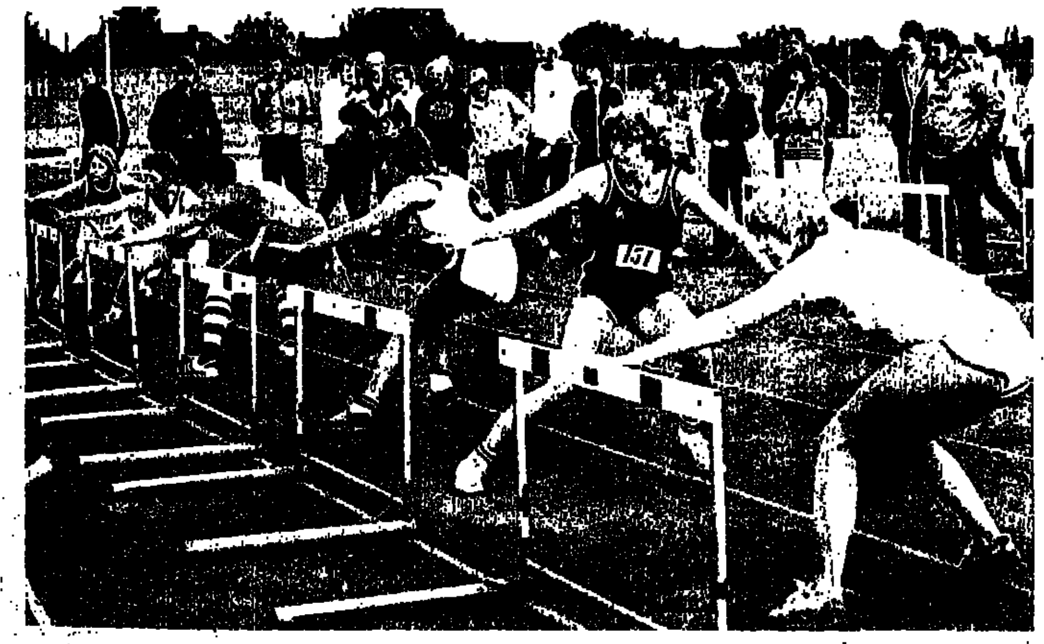
DUTCH AWARDS

Best individual lady: Corrie Rost van Tonningen (Control Data), 61 points; 2, Wilma v Montfoort (Crediet en Effectenbank), 59; 3, Margot v Galen (Infonet), 41; and 4, Gerry Mollenhorst (ARC), 39.

Best ladies' team: Control Data BV, 159 points; 2, Crediet en Effectenbank, 132; 3, Infonet, 130; and 4, ARC, 118.

Best individual man: Piet Walraven (Swets en Zeitlinger), 73; 2, Rob Kuhfus (Digital Equipment BV II), 68; 3, Henny Hesse (Crediet en Effectenbank), 66; and 4, Rick Inees (ARC), 58.

Best men's team: Crediet en Effectenbank, 195; 2, Swets en Zeitlinger, 191; 3, ARC, 186; and 4, Digital Equipment BV II, 163.



Team honours depended on the last race

"WE didn't realise until the start of the steeplechase that we had a chance," was the remark of Glyn Hesketh, captain of Midland Household Stores, just after he received the Men's team trophy at the final of Computastars on Saturday.

Not only were his team international winners, getting their trophy from Mrs Maureen Cairns, but they also won the George Wright Trophy for the best UK team.

Glyn's team amassed 213 points in a competition where the competitors set their own standards. This year the final was run on Decathlon lines, with all teams entering all the events and the top member of each team entering the individual competition.

Organiser Gordon Cairns said the standards were higher than ever and the leading teams were still contesting the last point.

Second placed was Data Logic while Rowntree Mackintosh, who also scooped the Queens Hotel Cup for the best combined ladies' and men's team, were third.

The events were pistol shooting, javelin, 400 metres hurdles relay, gym, soccer dribbling, hockey dribbling, short sprints and the steeplechase.

And from the results, it can be seen that despite Data Logic leading on the first three events, Midland Household Stores took the lead in the gym session and never looked back until a late threat came from the other front runners in the steeplechase.

There was not such an easy ride for Legal & General in the Ladies' team events. There was a state of [illegible] until the steeplechase.

At any time Rowntree Mackintosh, United Biscuits or Basams could have put in a bid for the honours.

Among the many honours being bid for was the Unipay Trophy for the best placed bureau, male or female. This was grabbed by Safe Computing's Men's team with 202 points.

RESULTS

Best UK Ladies' team – Legal & General 224 points; 2. Rowntree Mackintosh 209; 3. United Biscuits 200; and Joint 4. Basams and Thorn EMI (Hayes) 192.

Best UK Men's team – Midland Household Stores 213 points; 2. Data Logic 209; 3. Rowntree Mackintosh 204; and 4. Safe Computing 202.

Best Bureau – Safe Computing (Men) 202; 2. ARC 186; and, 3. Safe Computing (Ladies) 153.

Best combined Ladies' and Men's team – Rowntree Mackintosh 413 points; 2. Midland Household Stores 384; and, 3. United Biscuits 366.

Best international Ladies' team – Legal & General 224 points; 2. Rowntree Mackintosh 209; and, United Biscuits 200.

Best international Men's team – Midland Household Stores 213 points; 2. Data Logic 209; and, 3. Rowntree Mackintosh 204.

ABOVE – Tim Thickett of Woolworths (based at Rochdale) hurls his javelin across the field of play. Tim recorded one of the better throws.

BELOW – Among the many honours up for grabs was the Unipay Trophy for the best placed bureau team, male or female. It was presented by Gillian Evans-Gordon of Peterborough Data Processing to Safe Computing (pictured below).

LEFT – Short sprinting is not as easy as it looks. Here, the individual Ladies event shows, from left, Debra Howcroft (Thorn EMI at Telford), Bridget Cuthill (Legal and General), Wilma v. Montfoort (Crediet en Effectenbank), Jacqui Reed (Metal Box), Anne Harriman (MHS) and Angee Dunstan (Safe) battle it out.

RIGHT – The children were not forgotten as Safe Computing sponsored an art competition for the kids which was organised into Under 10 and Over 10 groups.

The prizes were presented by Ken Jackson, general manager of Safe. Over 10 winner was Tracey Lewis (13) whose father Joe is a technical analyst with BL Systems at Redditch. Under 10 winner was Tim Elkin (7½) whose father Bob is a consultant with . . . . Safe Computing!

ALL THE RESULTS

AS promised here are the results in full. They give running totals for each event in reverse order. The events in reverse order in which they happened are – steeplechase, short sprints, hockey dribbling, soccer dribbling, gymnasium, 400 metres hurdles relay, javelin and pistol shooting.

The results are also for the individual competition which was between the first named in each team who had to enter every event.

Ladies' team events – Legal & General 224, 187, 158, 126, 93, 77, 38 and 22; 2. Rowntree Mackintosh 209, 176, 149, 115, 79, 66, 39 and 25; 3. United Biscuits 200, 177, 147, 122, 89, 69, 39 and 22; Joint 4. Basams 192, 160, 135, 100, 70, 55, 40, and 18 with Thorn EMI (Hayes) 192, 166, 138, 107, 74, 63, 27 and 12; 6. Reckitt & Colman, 188, 169, 131, 102, 69, 53, 35 and 23.

7. PMSL 177, 143, 123, 115, 87, 64, 31 and 9; 8. MHS 171, 144, 116, 91, 79, 65, 26 and 10; Joint 9. Metal Box 163, 141, 115, 84, 60, 50, 29 and 19 with Segas 163, 136, 109, 81, 63, 51, 30 and 13; 11. Control Data BV 159, 136, 110, 95, 71, 56, 35 and 13; 12. Safe Computing 153, 134, 107, 81, 63, 51, 30 and 15.

13. London Transport 135, 116, 94, 65, 56, 45, 27 and 14; 14. Thorn EMI (Telford) 133, 114, 89, 70, 55, 41, 29 and 20; 15. Crediet en Effectenbank 132, 119, 96, 84, 54, 40, 28 and 13; 16. Infonet 130, 120, 120, 98, 68, 52, 34 and 20; 17. Norwich Union 121, 102, 80, 63, 54, 40, 37 and 21; and 18. ARC 118, 105, 84, 69, 39, 24, 18 and 9.

Ladies' individual events – Joint 1. Bridget Cuthill (Legal & General) 79, 67, 66, 44, 33, 26, 13 and 3 with Lucy Baines (United Biscuits) 79, 66, 55, 44, 33, 26, 16 and 12; 3. Anne Shafto (Rowntree Mackintosh) 75, 63, 52, 39, 27, 21, 12 and 6; 4. Louise Cotter (Segas) 72, 60, 49, 36, 30, 24, 17 and 6; 5. Elaine Perryman (Basams) 74, 59, 55, 49, 26, 16, 16 and 5; 6. Anne Harriman (Midland Household Stores) 65, 53, 43, 35, 31, 25, 12 and 8.

Joint 7. Carol Carter (PMSL) 63, 54, 50, 40, 31, 21, 10 and 5 with Glynis Finnerty (Reckitt & Colman) 63, 54, 45, 34, 23, 17, 11 and 7; Joint 9. Corrie Rost van Tonningen (Control Data BV) 61, 52, 43, 36, 28, 23, 16 and 4 with Sue Howells (Thorn EMI at Hayes) 61, 54, 45, 34, 23, 19, 7 and 1; 11. Jacqui Read (Metal Box) 60, 50, 40, 28, 20, 15, 8 and 4; 12. Wilma v. Montfoort (Crediet en Effectenbank) 59, 51, 41, 35, 25, 18, 14 and 6.

13. Angee Dunstan (Safe Computing) 54, 48, 38, 30, 24, 20, 13 and 6; 14. Debra Howcroft (Thorn EMI at Telford) 50, 42, 32, 24, 19, 13, 9 and 7; Joint 15. Pat Welford (London Transport) 43, 39, 31, 23, 20, 16, 10 and 5 with Heather Burnett (Norwich Union) 43, 35, 27, 19, 16, 10, 9 and 5; 17. Margot v. Galen (Infonet BV) 41, 39, 35, 31, 22, 16, 10 and 7; and, 18. Gerry Mollenhorst (ARC) 39, 33, 26, 25, 15, 10, 8 and 5.

Men's team events – Midland Household Stores 213, 183, 156, 129, 102, 80, 53 and 26; 2. Data Logic 209, 174, 148, 127, 106, 83, 53 and 29; 3. Rowntree Mackintosh 204, 175, 155, 134, 110, 82, 55 and 29; 4. Safe Computing 202, 174, 147, 133, 109, 86, 56 and 32; 5. National Provident 197, 169, 139, 116, 95, 77, 47 and 27; Joint 6 Crediet en Effectenbank 195, 169, 149, 126, 104, 81, 54 and 28 with Segas 195, 165, 141, 112, 94, 71, 50 and 30.

8. Swets en Zeitlinger 191, 165, 144, 130, 97, 78, 48 and 21; 9. London Borough of Lambeth 187, 157, 132, 112, 109, 78, 51 and 20; Joint 10. ARC 186, 166, 141, 121, 94, 72, 48, 24 with BL Systems 186, 158, 132, 110, 107, 88, 55 and 30; 12. CMC 180, 156, 130, 117, 114, 91, 61 and 26.

13. Compower 173, 136, 119, 97, 94, 74, 60 and 27; 14. Mettoy 167, 147, 121, 93, 81, 60, 29 and 19; 15. United Biscuits 166, 141, 119, 99, 96, 71, 44 and 21; 16. Digital Equipment BV II 163, 159, 133, 117, 90, 69, 51 and 30; 17. Digital Equipment BV I 160, 139, 115, 107, 92, 78, 48 and 28; 18. Woolworth 151, 136, 116, 95, 77, 58, 49 and 27.

19. Rank Toshiba 148, 133, 11, 89, 86, 64, 43 and 29; 20. Raet BV 144, 128, 104, 85, 82, 68, 50 and 30; 21. Control Data BV 142, 133, 114, 102, 75, 57, 41 and 29; 22. Infonet 141, 122, 102, 84, 63, 43, 28 and 17; 23. RAF 140, 130, 110, 91, 88, 72, 57 and 35; 24. Computer Data Services 137, 110, 90, 67, 64, 46, 34 and 18.

25. B.H. Blackwell 127, 113, 104, 97, 79, 59, 41 and 25; and 26. Data Process BV 120, 103, 87, 84, 75, 55, 46 and 31.

Men's individual events – Viv Oliver (Safe Computing) 75, 63, 52, 44, 36, 28, 18 and 9; Joint 2. Geoff Linnell (Data Logic) 73, 62, 52, 45, 38, 30, 20 and 11 with Dave Cross (National Provident) 73, 60, 49, 39, 32, 25, 15 and 6 as well as Piet Walraven (Swets en Zeitlinger) 73, 61, 53, 52, 41, 36, 26 and 15; 5. Paul Ellis (Midland Household Stores) 70, 61, 52, 43, 34, 27, 18 and 8; 6. Rob Kuhfus (Digital Equipment BV II) 68, 62, 55, 46, 37, 25, 21 and 11.

7. Jack Cook (Compower) 67, 54, 44, 35, 34, 24, 16 and 8; 8. Henny Hesse (Crediet en Effectenbank) 66, 56, 46, 41, 34, 26, 17 and 7; 9. Mike Allen (Segas) 65, 53, 43, 35, 29, 23, 16 and 9; 10. Joe Lewis (BL Systems) 64, 55, 46, 41, 40, 33, 22 and 14; 11. Martin Rigby (Rowntree Mackintosh) 63, 53, 48, 41, 33, 24, 15 and 7; 12. Martin Pearce (Mettoy) 61, 51, 42, 32, 28, 23, 16 and 10.

Joint 13. Rick Inees (ARC) 58, 53, 43, 39, 30, 25, 17 and 10 with Neil Coyne (RAF) 58, 50, 41, 32, 27, 22 and 14; Joint 15. Grant Kleiner (CMC) 57, 50, 41, 37, 36, 30, 20 and 9 with Paul Whyte (Lambeth) 57, 46, 41, 40, 39, 27, 18 and 7; 17. Wouter Noske (Control Data BV) 52, 48, 41, 35, 26, 22, 17 and 12; Joint 18. Johan Brouwer (Digital Equipment BV I) 48, 43, 36, 35, 30, 27, 17 and 11 with Theo Verbruggen (Infonet BV) 48, 42, 34, 28, 21, 16, 11 and 5.

20. Bob Meldrum (Rank Toshiba) 46, 40, 33, 24, 23, 17, 10 and 4; Joint 21. Jos Hofmans (Data Process BV) 45, 32, 26, 25, 22, 19, 16 and 11 with Roel Brand (Raet BV) 45, 42, 33, 23, 22, 19, 13 and 9; 23. Colin Spencer (United Biscuits) 44, 35, 32, 31, 30, 22, 13 and 3; 24. Mike King (B.H. Blackwell) 43, 38, 36, 26, 20, 14, 8 and 1.

25. Tim Thickett (Woolworth) 40, 35, 27, 26, 20, 16, 13 and 7; and, 26. Geoff Khan (Computer Data Services) 39, 29, 23, 15, 14, 9, 5 and 1.

Thanks!

THE sponsors – Computer Weekly, Wright Air Conditioning and Computable – would like to thank Gordon Cairns, Maureen Cairns, Keith Wilson, Geoff Brown, Ria Evers, George Simpson, Jean Brown, Beverley Simpson, Adi Coyajee, Wes Evers, Bert Lubbers, Loet Quant, Frank Albery, Sydney Bryson, Eddie Dalton, Les Headley, Rob Kane, Jean Joyce, Russell Millar, John Milne, Glen Wilson, Justin Cairns and Violet Albery for their help in making Computastars so successful.

PRODUCT NEWS INTERNATIONAL

Electronic clocking-in based on Intel 8085s

ELECTRONIC time recording that replaces the traditional clock card and gives management reports on each day's attendance, hours worked and overtime can be achieved with Plantime's Plantime-Four system. Based on Intel 8085 chips built into terminals, workers clock in and out using a personal nylon key. While the key is inserted, the worker's works number, hours worked so far, and overtime accrued appear on a 32-character, liquid crystal display. This enables only the worker to see the information.

On a basic system, up to 2,000 workers can use any of up to 32 terminals in the works. The system can be pre-programmed to operate eight different weekly or fortnightly working timetables, each consisting of any permutation of eight different types of working day or shift. These include shift work, day work, part-timers, flexible hours and staff hours.

All terminals are connected to a communications and monitoring centre, although smaller systems may use them on a standalone basis. All terminals have their own 4K memories and chip sets. If one fails, the others can still function.

The centre's own memory is a minimum of 8K with computer-compatible output on floppy disc.

Terminals communicate with the processor and with each other via repeater units so that any terminal may be removed without interrupting the data path. Up to eight terminals can be on each of the four loops. Communications speed is 9,600 baud on 20 milliamp current loops.

Management can obtain automatic printouts which include details of attendance, clocking in and clocking out times analysed according to department and working group within that department.

Foremen can also have an attendance indicator which shows lights beside people's names once they have checked in.

Weekly or monthly reports can also be printed as well as an individual attendance record for each worker if required. Attendance data can be run directly on the payroll program from the floppy disc.

Plantime Ltd (CW), Shakespeare Industrial Estate, Shakespeare Street, Watford, WD2 5HD. Tel: Watford (92) 44300.

Our picture shows Plantime's Intel 8085 based replacement for traditional clocking-in machines being used. Each worker has a personal nylon key for clocking-in. On the basic system up to 2,000 workers can use up to 32 terminals at a work place.

Dual role work station

FROM forms handling manufacturer Wilkes-Multimatic comes a work station designed to double as a terminal table. It has a raised back edge to prevent the possibility of a terminal being pushed off accidentally and is available in either green or buff, with an anti-glare finish. Wilkes says the surface can be wiped clean and is resistant to burns or stains.

There is also an optional adjustment copy holder and an adjustable foot rest. The work station can be arranged to suit left- or right-handed workers.

There is also a shelf sited below the working surface for papers, files or the operator's personal belongings.

Wilkes says the work stations can be sited back to back or side to side. Full length modesty panels are also fitted.

Wilkes-Multimatic Ltd (CW), Parkfield Road, Wolverhampton, WV4 6EL. Tel: 0902 49434.

Industrial digital controller

GEC SEMICONDUCTORS introduces an industrial digital controller designed to operate as a slave to the Intel iSBC 911 microcomputer. GEC says the idea behind this device is to process most digital input/output signals, thus freeing the master micro from routine tasks.

The firm suggests typical applications of switch sensing, motor speed control, stepper motor application and serial communications.

The controller is said to be able to sense a change of state, count and generate pulses as well as measuring time periods and frequencies. There are nine pre-programmed primary functions which may be requested by the master micro. Each primary function has a specific input/output task.

Commands can be split into two categories: control and utility. Control commands are those used to start and stop a primary function. Utility commands are typically associated with moving data or reading status. Any of the 16 I/O lines not used by a primary function are available for general purpose I/O through the use of utility commands.

The device is housed in a DIP package and requires a single five volt DC power supply.

GEC Semiconductors Ltd (CW), East Lane, Wembley, HA9 7PP. Tel: 01-904 9303.

16 channel analogue signal multiplexer

A SIXTEEN channel analogue signal multiplexer, Model 3420, which is said to have a low series resistance of 0.5 ohms and inter-channel isolation of over 10^9 ohms is available from Farnell International.

Made by Data Precision, it can be used with any data acquisition system and is compatible with equipment having a computer interface such as the 4½ and 5½ digit Data Precision 3400, 3500 and 7500.

Model 3420 is said by Data Precision to provide up to 16 two-wire data channels or eight four-wire channels in addition to having a guard connection.

The unit allows selectable dwell times of 0.1 to 10 seconds and has four operating modes. Operator-selectable, the unit will automatically scan the channels, and the channel can be selected sequentially or randomly by external programming.

The unit weighs 2.5 kilograms and comes with final calibration results, certificate of conformance, handbook and a one-year guarantee.

Farnell International Instruments Ltd (CW), Sandbeck Way, Wetherby, LS22 4DH. Tel: 0937 63541.

81.4 million byte disc pack

A DISC pack designed for use on the Calcomp Trident T80 disc drive has been introduced by 3M's Data Recording Products Group. Called Scotch 947/80, it can hold up to 81.4 million bytes. Each pack has 808 tracks and seven alternatives on each of the five recording surfaces. It is 5.5 inches high and 15 inches in diameter.

Data Recording Products Group, 3M United Kingdom Ltd (CW), PO Box 1, Bracknell, RG12 1JU. Tel: 0344 58469.

Torque screwdrivers

GROWING awareness of the importance of correct fastener tension in the assembly of electronic equipment and computers has prompted MHH Engineering of Guildford, Surrey to introduce a range of torque screwdrivers.

They are available with either ¼-inch square drive spindle for use with nut sockets or ¼-inch AF female hexagon socket which will accept screwdriver blades or Philips' head blades. Both versions can be converted by the use of adaptors.

All models are said to incorporate a calibrated triple scale sleeve for adjustment without resetting equipment and a locking ring to prevent accidental alteration through careless handling.

Operation is bi-directional and the tools "slip" at pre-set torque. Resetting is automatic after one third of a turn.

MHH Engineering Co Ltd (CW), Bramley, Guildford, GU5 0AJ. Tel: 0483 892772.

Lock-operated switch

INDUSTRIAL safety specialists Castell Locks has introduced a key mechanism which enables its range of lock-operated switches to be used as a single unit power control and to access interlocks.

On the Type P1, it is said to obviate the need for mechanical interlocking with many types of machine guards. The Type P1 is mounted within the machinery enclosures behind the access point and the machine's power control circuit wired through it. A variety of types are available, including rating up to 63 amps, 480 volts AC.

Castell Locks Ltd (CW), Kingsbury Works, Kingsbury Road, London, NW9 8UR. Tel: 01-200 1299.

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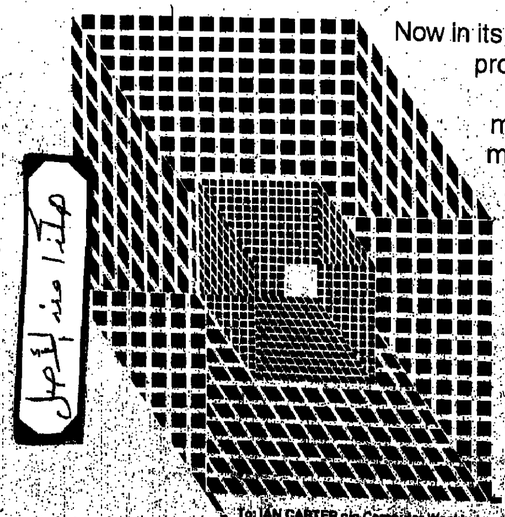

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BOOK REVIEWS

How do you measure up?

How to assess your managerial style, by Professor Charles Margerison. 132 pp. £10.95. MCB Publications, 198-200 Keighley Road, Bradford, BD9 4JQ. Tel: 0274 43823.

UNTIL recently, DP management has typically been isolated from the main stream of company management. DPMs tend to be regarded as more involved in technology than management.

The responsibilities of DPMs embrace or overlap most, if not all, areas of management, including production, stock control personnel, administration, O & M, finance, R & D, planning and forecasting.

Now with the movement towards DP integration, whether by distributed processing, the introduction of the mighty micro or the thrust of the electronic office, the DP team probably feel themselves being remorselessly drawn into the company.

Ambition

The publication of this book is opportune. The author believes that, by taking a challenging look at your own managerial style, strengths and weaknesses can be revealed, checked and, where necessary, improved.

The volume is structured on a basic premise of leadership, opportunity, motivation and ambition. It is very much a "do-it-yourself" style of book with ample exercises, rotines and questionnaires.

Although at times a knowledge of Logs and advanced algebra would help the reader in evaluating the results, the book remains a practical and stimulating study.

Stress

The style and presentation of the book certainly adds to the reader's understanding and interest. If only the average computer manual was one half as attractively produced, there could well be a noticeable improvement in installation efficiency and productivity.

Irrespective of future technical developments, Chapter 8, "Do you work under pressure", can be recommended to DP management. An impressive score is guaranteed in respect of the stress and strain of pressure charts.

ALAN SIMPSON

One of the best yet on networking

Computer networks and their protocols, by D. W. Davies, D. L. A. Barber, W. L. Price and C. M. Solomonides. 487pp. £17.50. John Wiley & Sons Ltd (CW), Baffins Lane, Chichester, Sussex.

THIS book is a sequel to Communications - Networks for Computers, published by Wiley in 1973, written by the first two authors named above and was concerned with the technology created by the convergence of DP and telecommunications and the emergence of systems that combine them to provide teleprocessing services.

The two books complement each other so that, together, they form one of the best and most comprehensive surveys of computer networks yet available.

After an introductory chapter, there are chapters on packet switching, routeing, flow control and congestion avoidance as well as on packet broadcasting systems, including packet radio and satellite systems.

The next three chapters give extensive descriptions in considerable detail of some of the most important protocols, which are the strictly defined procedures for interaction across an interface and communication across a network.

Extensive

The protocols covered here include HDLC, X25, transport service, other higher level protocols, and terminal handling protocols (X3, X28, X29, and virtual terminal protocols). The authors also describe briefly their views on unified protocol design.

There is then a short chapter on data security, data encryption, and message and user authentication.

The final chapter, on network optimisation, includes discussions of network reliability and availability, and optimisation of line capacity and flow. There is a glossary and a general index, and each chapter ends with references to relevant literature.

Clear

The presentation is clear and mostly non-mathematical and suitable for those with a general background in DP and/or telecommunications.

The book will be specially useful for those concerned with the practical design and operation of computer networks and also for network designers; as such, it is excellent.

However, it gives only brief discussions of theoretical and simulation methods for investigating networks and it does not consider the techniques and problems of network performance measurement.

ALAN MAYNE
University College London

Thought provoking

Systems Analysis, by Andrew Parkin. 220pp. £6.95. Edward Arnold (Publishers) Ltd (CW), 41 Bedford Square, London, WC1B 3DQ. Tel: 01-637 7161.

THIS typed volume covers the normal material for systems analysis and design in an interesting and thought-provoking manner, and tends to be oriented towards database systems.

It contains a large number of questions and answers as well as a case study. The book attempts to avoid the use of jargon and buzzwords.

Throughout, the author has tried to draw attention to practical design problems and limitations, and he also deals with the security and personnel aspects of systems.

Analysis and design is changing, and this compact book contributes by stimulating a re-think of the role of this work. It is well worth reading by students and all involved in data processing, but beginners may find that some parts of it need expansion and explanation by a lecturer or a text on special topics.

FRED THOMAS

Abstracts from Romanian journals

Abstracts of Romanian Scientific and Technical Literature, compiled by the National Institute for Information and Documentation. 183 pp. International Exchange Department, P.O. Box 33-35, R-70141 Bucuresti, Sector 1, Str. Cosmonautilor 27-29.

FEW books can command such riveting attention as "Abstracts of Romanian Scientific and Technical Literature". For a start, the presentation is decidedly early English generation. While the style bears close resemblance to certain Basic programming, it would shame even a mediaeval telex machine.

One brief section is devoted to electronics, and this is limited to 13 abbreviated, level typewritten synopses of a sort you might discover over port and cheese at each UK campus of polytechnic or Sheffield Poly.

Even the redoubtable magazine Time Out would find it difficult to organise a cultural exchange visit to a Romanian computer installation.

FOCUS

Case study method used with success

Structured Systems Analysis: Tools and Techniques, by Chris Gane and Trish Sarson. 373pp. £15. Improved System Techniques SA (CW), PO Box 118, 1,196 Gland, Switzerland.

CASE studies are good vehicles for explanation and this large, detailed and typed book uses the case study method with success. It also contains a large number of illustrative diagrams.

The methodology proposed is applied in a top down, database oriented, system design.

The analytical role is separated from the design role, but the emphasis is on the latter, and the problems of ensuring that the analyst identifies and specifies all the relevant facts, in the first place, are not developed in the same detail as the design aspects.

Concept

The structured concepts put forward are well worth consideration by any systems analyst who will need to allow for the very American approach in this book.

Unfortunately the authors do not appear to consider documentation standards such as those of the National Computing Centre, which may have helped them to avoid the use of a lot of new symbols. The preference shown for decision trees over decision tables may also be personal to the authors.

Myth

Clearly, documentation is shown as an integral part of, and as an aid to, design work and if the myth that "documentation is something done at the end" is killed off, then the book will have served a very useful purpose.

The authors' case may be overstated by comparing good structured design with some not so good "direct" design, but they present a good idea enthusiastically.

FRED THOMAS

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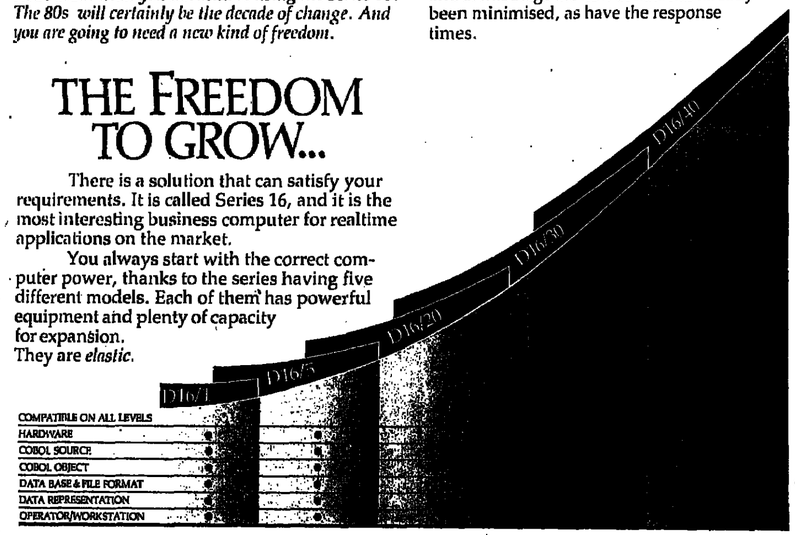

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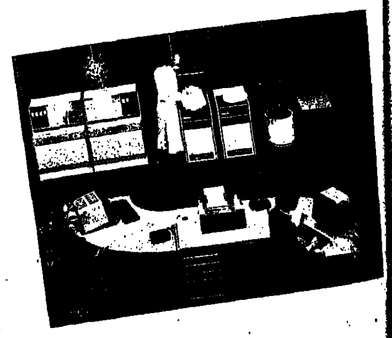

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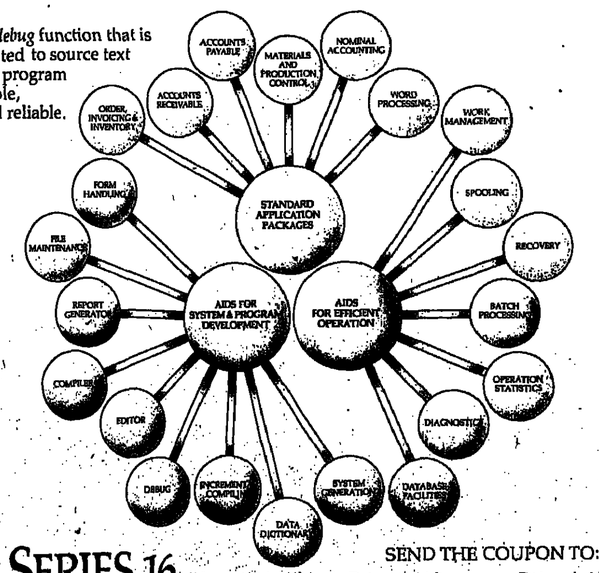

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```
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Bank—Central London—RPG II, Sys. 34s

- ★ Money is no problem, to circa £12K.
- ★ Real Time Development — State of the Art.
- ★ Amazing prospects and career path.
- ★ Benefits include CHEAP MORTGAGE and Non-Contributory Pension.

Quote Ref. 80187

ANALYST

Victoria — **Neg. to £12K + Perks.**

- ★ Oil company.
- ★ Minimum of 3 years' Commercial Analysis, with a stable work record.
- ★ To work on Real Time Database applications
- ★ Great Company and working atmosphere

Quote Ref DJ80188

SYSTEMS ANALYST

Central London — **Totally Neg. + Mortgage**

- ★ Minimum 3 years' Analysis.
- ★ Hopefully Programming and/or Financial Background.
- ★ Well established financial services company.

Quote Ref DJ 80189

PROGRAMMER—IBM (Pref.)

North Middx. — **c£8K + Bonus**

- ★ Cobol, 1 year plus.
- ★ IBM preferred but not essential.
- ★ Hopefully keen on developing along the technical aspects.
- ★ Benefits include non-contributory pension, canteen and Xmas Bonus.

Quote Ref DJ 80186

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TEL 01-439 3671

SALES

Why should you move if you are already a success?

. . . because we know you take great pride in performance, and we know that given the RIGHT opportunity you are ambitious enough to want to improve.

Our client is the rapidly growing division of a major multi-national corporation with a yearly turnover in excess of £500 million. The division has been in operation for eighteen months and is responsible for marketing and selling one of the most sophisticated mini-computers available. The product, developed in the United States, has been an outstanding international success, and its U.K. launch has been met by a massive demand. The equipment is ideal for both first time and existing computer users and has been developed to cope with all types of commercial business applications. These include Invoicing, Stock Control, Sales Ledger, Payroll etc. The machine also provides Word Processing and Data Communications facilities.

The first years trading has brought astonishing success and the division, operating from prestigious CENTRAL LONDON premises, now intends to increase its sales force in London and the Home Counties.

To be part of this success story you will already be successfully selling commercial computing systems. You will almost certainly be working for a computer manufacturer but have begun to feel cramped by the lack of career opportunity and inherent bureaucracy. You are seeking an alternative that will allow you to develop your entrepreneurial skills in a growth market, and within an organisation offering ground floor opportunities, high financial rewards, a visible route to the top, and realistic and achievable sales targets.

On target earnings will be £16,000 but the real earning potential is in excess of £20,000. You will receive a basic salary of c£8,000 and be provided with a COMPANY CAR. Additional large company benefits include an attractive Pension Scheme, 4 weeks holiday and usual expenses.

If you think you have the character, presence and drive necessary, contact JOHN WYNTON at Modem to arrange immediate appointment for interview.

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Please send me your 'SALES' information Package.
Name
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Recruitment LOGISTIX in informatics

Systems Engineers T. P. Specialists DBMS Consultants

West Germany and Benelux:
Salary £22K + Benefits

An Internationally renowned Supplier of Data-Base and Teleprocessing Management Systems has retained **LOGISTIX** to identify top-calibre professionals for its Continental European operations. We are seeking Software professionals currently employed as:

SYSTEMS/SOFTWARE ENGINEERS
T.P. CONSULTANTS
D.B.M.S. SUPPORT ENGINEERS

THE COMPANY: Since the Company installed its first product in 1968 in U.S.A., operating divisions have been successfully established in European, Australasian and South American markets. The Company has served over 300 clients installing on-line and DBMS System Software whilst to date the number of installed product units exceeds 10,000.

THE PRODUCTS: Some of the Company's recent projects have included the following:

* **DEVELOPMENT OF DATA-BASE AND REAL-TIME SYSTEMS AND PROGRAMMING STANDARDS**
* **DATA-BASE PRODUCTION CONTROL SYSTEMS**
* **TURNKEY APPLICATIONS AND SYSTEMS SOFTWARE PACKAGE DEVELOPMENT**
* **CONVERSION FROM OTHER D.B. AND T.P. SOFTWARE**

THE PEOPLE: These very important positions will appeal to those who wish to live in a multi-lingual society (French/German/Dutch) and can already offer reasonable fluency in one of these languages. Vacancies for Systems Engineers or Software Consultants exist in the Rhineland, Bavaria, Brussels and Amsterdam. There will be future career possibilities in Geneva and Zurich. Technically, you must demonstrate continuous and current experience in either the implementation or the support of Data-Base and Teleprocessing Systems. As a general requirement all candidates should have had involvement in the installation of Teleprocessing or Data-Base software, systems generation, benchmarking and testing in a sophisticated large-scale user. Personal communication skills such as the ability to liaise effectively at both directorship and project control levels are highly desirable. Project management skills together with exposure to pre- and post-sales activities, e.g. customer presentations, product demonstrations, user workshops and contract tenders will reflect in the already generous salaries on offer.

Particular experience must include systems engineering or technical support involvement with at least one large-scale or multi-user of IBM 370/303X or Amdahl V6/8 hardware. Our clients will also consider relevant those candidates who have either evaluated or acquired practical knowledge of the products of any other IBM plug compatible vendor. All respondents must demonstrate "hands-on" software/systems experience with one or more of the following: **IMS DB/DC CICS/VS** and **MVS**. Alternatively, it is a decided bonus to have worked with the T.P. or DBMS software of an independent supplier, namely **TOTAL and/or ENVIRON, PANVALET, SHADOW, IDMS or RAMIS.**

THE BENEFITS: The higher-than-average salaries (even by Continental standards) reflect the prominence which our client places on the acquisition of these key personnel. As part of a comprehensive range of benefits, you will receive life and disability insurance, pension and medical plans, liberal mileage allowances and, where appropriate, relocation expenses. Willingness to relocate during the course of employment and to travel on essential assignments within Europe and U.S.A. is mandatory.

THE INTERVIEWS: We will initially interview U.K. candidates in our London office after which candidates will be short-listed to meet the Company's senior management in either Belgium or Germany. Candidates already resident in E.E.C. countries will be invited to attend interviews at one of the Company's regional offices. Offers of employment will be made no later than ten days after interview.

CONTACT: Please telephone or write to one of our Advising Consultants or alternatively submit a fully documented resume.

(2723)

Logistix, 10 Grenville Place London SW7 4RW

01-373 3063 LOGISTIX Telex: 28800

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JBA

Projects Controller Defence Systems

Cheshire **up to £14,000**

An impressive international project record and a successful management policy has established our client as one of the leading European systems houses.

The growth of the company over the past ten years has reached the point where they require a technically accomplished manager, reporting directly to the Production Director, to assume responsibility for all aspects of defence contracts.

The individual they seek will be able to demonstrate considerable experience and capability in the successful management of large and small scale defence projects, and have the ability to provide professional appraisal of defence study methodologies and an assurance of the integrity of current systems.

A knowledge of command and control, communications and information retrieval systems is highly desirable, while familiarity with defence standards would be an asset.

Salary as indicated above, while career development and advancement policies are designed to recognise and reward technical competence.

So if you would like to explore this exciting opportunity further, please contact:-

Margaret Stevens
JAMES BAKER ASSOCIATES,
International Personnel Consultants,
32 Savile Row, London W1.
Tel: 01-439 9311.

(2787)

UNIVERSITY OF WARWICK

MICROPROCESSOR SUPPORT STAFF

In the Computer Unit, which provides computer services to all Departments of the University, recently extended to include the support of microprocessors and their applications. The main duties of this new post will lie in the hardware area, concerned with the design and implementation of microprocessor-based systems. Applicants should have a degree or equivalent qualification and some experience in the microelectronics sphere. The post is tenable immediately and the appointment will be made on one of the following scales at a point commensurate with qualifications and experience: IB — £4,795-£8,095 p.a. or IA — £5,505-£9,595 p.a. (both under review).

Further particulars and application forms from the Secretary and Registrar, University of Warwick, Coventry CV4 7AL, quoting Ref No 6/B/80/26. Closing date for receipt of applications 17th October, 1980.

(2741)

SURREY COUNTY COUNCIL

REVIEW OF APPROVED LIST OF SUPPLIERS CONTINUOUS COMPUTER STATIONERY

Those wishing to be included on the above approved list should write, requesting application forms, to the County Supplies Officer (Ref. DLW), Surrey County Council, Supplies Department, [illegible] Road, Longmead Estate, Epsom, Surrey KT19 9AL not later than 24 October, 1980.

(2728)

The Polytechnic of Central London
School of Engineering and Science
Mathematics and Computing Division

TEMPORARY FULL-TIME LECTURER II
(fixed term appointment)
PART-TIME LECTURERS IN COMPUTING

There are urgent vacancies for the above and the courses in the area are at BSc HND and HND Endorsement levels and the subjects required to be taught are in the areas of Computer Systems (Hardware and Software) and Programming.

Application forms from the [illegible]

NEXT WEEK

NORTHERN RECRUITMENT FEATURE

Advertisers are reminded that the next Computer Weekly Northern Recruitment Feature will be published on September 25th and will highlight career opportunities in the North.

Space reservations should be made as soon as possible to:
Owen Kelly—Manchester—061-872 4211
Julie Hannaford—London—01-261 8002

Copy Deadline PM Friday before

COMPUTER WEEKLY
THE INDUSTRY'S WIDEST READ AND MOST REQUESTED NEWSPAPER

COMPUTER WEEKLY

Building Societies Recruitment Feature

OCTOBER 2 ISSUE

The October 2 issue of Computer Weekly — Britain's largest circulated computer publication — will contain a special feature outlining the career opportunities and employment prospects for data processing personnel offered by Building Societies.

Computer Weekly is the only publication to regularly publish editorial features covering a variety of subjects linked to the job market scene. In view of the continuing shortage of qualified DP Personnel, the need to create a greater awareness amongst readers of the scope and future career prospects available is all important.

The combination of this special editorial feature and Computer Weekly's large penetration amongst analysts, programmers and operations staff, provides a first class recruitment advertisement platform.

Computer Weekly has the largest circulation in the specialist computer press (91,656 ABC July-Dec 1979). This has increased continually over the years to reflect the ever growing number of personnel in the computer industry. Additionally, and equally important, the newspaper has the highest number of individually requested copies of any weekly computer publication.

Advertisement rates are based on £16.00 per scc, and to be sure of your space reservation in this important issue, advanced reservations are advisable. Copy deadline is Friday, September 26th.

Contact: London 01-261 8028
Manchester 061-872 8861
Birmingham 021-356 4838

COMPUTER WEEKLY

THE NEWSPAPER COMPUTER PEOPLE RELY ON

Published by IPC Electrical-Electronics Press Limited
Dorset House, Stamford Street, London SE1 9LU
Company registered in England Registration Number 677128

Young Application Programmers – Saudi Arabia

Saudi Arabia is a rapidly developing area with considerable market potential for our client, the main distributor for a leading international mini computer manufacturer.

Let us set the scene:- no expense has been spared to make the lifestyle lavish. You will be living in a spacious villa with meals and household needs seen to by domestic staff. You will be free to enjoy your leisure time as you please, in the company of your work associates or at the local recreational facilities. A car will be available when required for travel on business or pleasure. All this is provided at the company's expense, plus, of course, a generous tax free salary.

But it's not all play - the demand for company products means there is plenty of interesting work to be done, in this lively and stimulating environment.

To be considered you need to have 2 years applications programming experience working in COBOL or RPG on mini computer systems.

To find out more about these bachelor status positions please telephone (24 hour answer service) or write to Phil Chapman quoting ref: CW 151-C

(2777)

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Computer and Professional Personnel Consultants
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U-C-A

Systems Analyst/Senior Systems Analyst

£6,000-£9,000 NEAR COLCHESTER

A major international company with the latest IBM DOS/VSE CICS T/P DL1 installation is keen to recruit systems analysts (with a programming background) at various levels to work on brand-new financial projects. The company offers excellent perks including flexitime, non-CPS, a concessionary rate mortgage assistance, and relocation expenses to this beautiful part of Essex. All you Programmer/Analysts apply now! CW38/1 Michael.

Sales Support

London and Home Counties To £9000 + Car

We have six MINI computer manufacturing companies with offices around the country who require people with the confidence to deal with clients in a pre- and post-sales situation. All vacancies require a programming background on minis and the jobs will provide an exciting and satisfying career. (IBM or other mainframe experience is also an advantage.) CW38/2 Michael.

Basic Programmers

S.E. England £8,000-£9,500

I bet you never knew how popular you were! We now have over 15 registered vacancies for BASIC and BASIC + programmers. Opportunities exist in the City, S.E.1, Brentford, Harlow, Pinner and Maidenhead for people with 1½ years or more experience. Career growth is assured and most offer very attractive perks. CW38/3 Michael

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IBM SYST. PROG. CICS DOS	Surrey 6 mths
IBM COBOL OS/VS 1	Devon 3 mths
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Ring Irene

UCA 01-995 3883

Recruitment Consultants
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(01-958 8748 Evenings)

UNIVERSITY OF ST ANDREWS
Computing Laboratory

MICROPROCESSOR ADVISER

Applications are invited for the post of Microprocessor Adviser with the computer service. Applicants should be educated to honours degree standard, or its equivalent, and should have experience of microprocessor hardware and software.

The post will involve advising members of research and teaching staff in the use of microprocessors in experimental control, teaching applications and computer communications. The post is mainly an advisory one, although it may develop some ongoing research and development aspect for work concerned with the provision and maintenance of a modern computer service. The Laboratory uses CROMEMCO and MDOC microprocessors and 2 DIGITAL VAX 11/780 mainframe computers.

The salary is on the University 1A scale for Other Related Staffs £5585-£9685 per annum, plus superannuation under USS.

Applications (two copies preferably in typescript) with the names of three referees should be lodged by 3rd October, 1980 with the Establishments Officer, The University, College Gate, St Andrews, Fife, from whom further particulars should be obtained.

(2771)

LEICESTER POLYTECHNIC
SCHOOL OF MATHEMATICS, COMPUTING AND STATISTICS

LECTURER II/ SENIOR LECTURER

(Post No 69)

The lecturer will join a group of OR specialists teaching on degree and postgraduate courses in a variety of disciplines. Applicants should have an appropriate degree with experience in industrial/commercial OR. Encouragement will be given to continue with consultancy/research. The polytechnic has extensive computer facilities including microprocessors which are available to staff.

Salary £6012-£10839(bar) - £11295 pa

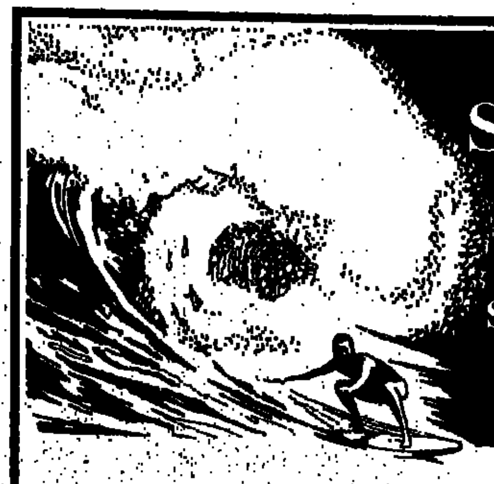
Application form and further details from Staffing Officer, Leicester Polytechnic, P.O. Box 143, Leicester, LE1 9BH. Tel: 551551 ext 2303/1.

(2770)

Herts Hardware Consultant

User support

(0707) [illegible]



PRODUCT SPECIALIST/ ENGINEER U.K.

Starting Salary to £8000 + car + training in California.

Our client, a highly successful American Manufacturer, are World leaders in advanced Disc Memory devices.

They are now entering a most exciting phase of expansion in the UK and Europe.

This expansion has created an excellent opportunity for a first class Engineer.

Working in a pre sales advisory and post sales support role to OEM's and systems houses, the successful candidate should already possess Disc Drive experience with some knowledge of controllers and Disc operating Software.

Full training will be given in California.

Here is an opportunity to ride on a crest of a wave and capitalise on the company's growth, products and refreshing marketing attitude.

In the first instance contact, in confidence, Andrew Carter on 01-935 0671 or (evenings and weekends) St. Albans 35035.

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Birmingham 021-236 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY
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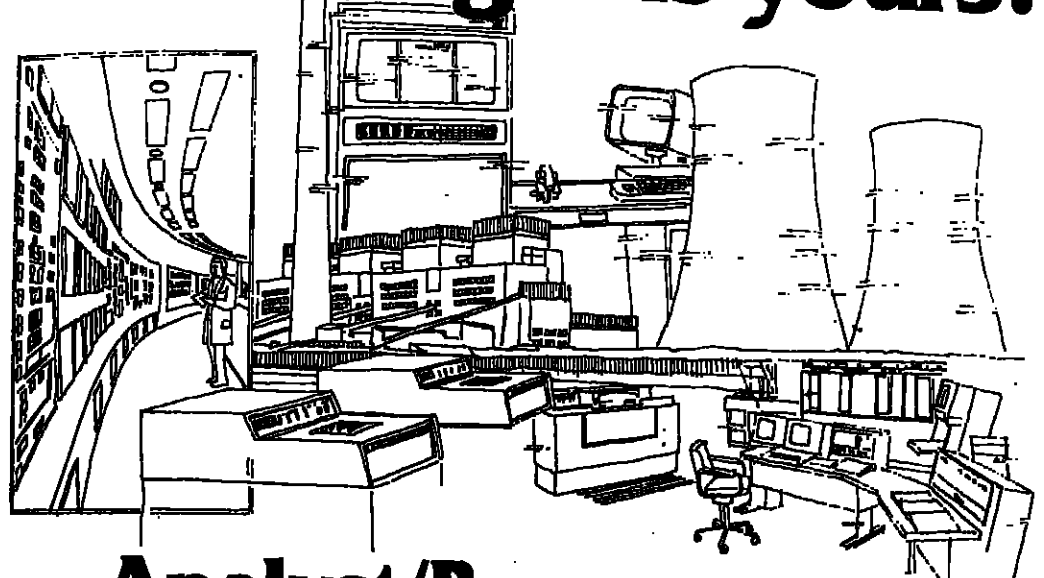

Analyst/Programmers

Accept the challenge of 2/3 year contracts in South Africa.

Escom, the largest electricity generating utility on the African Continent, has a projected growth that is just one of the symptoms of the current South African economic boom, and is putting into motion plans to double its present capacity by the end of the 80's.

In offering 2/3 year contracts to experienced computer staff, Escom have created an opportunity for you to gain invaluable experience in a stable, progressive organisation. This applies to computer personnel across the board, and in an industry where a staff increase from 45 000 to 97 000 is envisaged in the next decade, it's obvious how your expertise fits into Escom's programme. The data processing division forms our central nervous system and extends to every function to ensure constant, effective operation, and we now need the following people to join our professional team.

Analysts/Programmers

Ref DP/1

1. Ability to perform the full spectrum of D.P. activities in development and maintenance of application systems.
2. Ability to train our D.P. staff — any level involved.
3. Project Management experience including project staff supervision, schedule control, customer relations.
4. Systems analysis experience on three sizeable systems (over 20 programs).
   Our applications include:
   ★ Personnel (Leave register, manpower, planning, pensions).
   ★ Loans (Local and overseas).
   ★ Inventory Control, Purchasing, Contracts (Local and overseas), Material Requirements planning.
   ★ Power Sales, Management Accounting, Budgetary Control.
   ★ Assets Register, Mobile Equipment Scheduling and Control.
   ★ Power Station Maintenance, Mine Performance Analysis.
   ★ Nuclear (Personnel Dosimetry and Fuel Accounting).
5. Systems Design experience on 3 sizeable systems. Our environment includes:
   — ICL 2956 and 2904
   — DME operating system
   — TRAN communication network.
6. Programming competence in COBOL on ICL 2900 under DME or 1900 mode.

Software Analysts/ Programmers

Ref DP/2

You will be concerned with broad-spectrum programming techniques to afford you the opportunity of extending your experience and utilising your full potential. Your area of involvement will include:

★ Maintenance and support of ICL Operating systems on local and remote computers.
★ Maintenance of existing Escom software systems and utilities.
★ Technical support to users of the ICL computers.
★ Design and programming of new Escom software systems and utilities.
★ Assistance in the support of Data Communications network software.
★ Evaluation of new ICL software release and enhancements.
★ Operating system performance analysis and tuning.

To make the contribution we expect, you will need to have thorough knowledge of programming techniques with at least 3 years' relevant experience. Knowledge of ICL PLAN or at least some experience using ICL hardware and JCL is also a prerequisite. If you're also familiar with ICL GEORGE 2, DME/2 and on-line modes of operation you'll definitely qualify for our short list.

Power System Engineers (Computer Applications)

Ref DP/3

Duties
★ Assists power system engineers by investigating and analysing problems arising in power system planning, operation and control.
★ Investigation, evaluation and development for computer application of new improved mathematical techniques and analytical engineering methodology for solving above problems.

Experience
★ B.Sc. degree in Electrical Engineering.
★ ± 6 years of power system computer application experience.
★ Enterprising, self motivated, creative persons.

WE OFFER
★ Attractive salaries in a country with a low cost of living and taxation figures.
★ Medical aid.
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★ In addition, South Africa offers excellent schooling at all levels, beautiful countryside and scenic holiday resorts, and first class sporting and recreational facilities.

Interviews will be conducted in the U.K. in October. Please apply before October 9, quoting the appropriate reference, with full curriculum vitae to: The Manager, Escom, 723, The Adelphi, John Adam Street, London WC2N 6PL.

ESCOM
The Force behind the Power

(2780)

ANALYST/PROGRAMMERS

London IBM Cobol/PL1/Mark IV/IMS

Tel: Roger Barnes on 01-628 4200
160 Copthall Avenue, EC2R 7DA

SDA

(2580)

BOX Nos.

Box number replies should be addressed to:

Box No.
c/o Computer Weekly
Dorset House
Stamford Street
London SE1 9LU

HERTS. MICROS

Mini or Micro experience, 2+ years in Assembler programming preferably with Basic for development work on intelligent terminals (Intel and Texas based). Small, expanding company with excellent career opportunities.

c £7.5K

COBOL MAINFRAME

Analyst/Programmer and Programmer with COBOL experience on Honeywell, IBM or ICL required to meet expansion plans at Head Office of International Manufacturing Group in West London. Honeywell installation with network of minis.

c £8K

DB — SALES SUPPORT

Analysts with general financial background, and some knowledge of data base products required by major TB and DB Systems Suppliers based in Berkshire. Mobility is of prime importance for visiting UK clients.

to £11K

SYSTEMS PROGRAMMER

1-2 years' Systems Software in Assembler on Minis plus CORAL for design, development and providing technical support to Dutch client of Herts.-based Mini Manufacturer. Degree preferred, ability to work alone effectively essential. Travel to Holland required.

c £8K

MINI DEVELOPMENT

Analyst/Programmers and Team Leaders with Assembler on Minis (e.g. DEC, DG, Burroughs, etc.), required by Development Group of leading Mini Manufacturer. Experience of Interfaces and Interactive Systems of particular interest. Base is in South Middx.

to £10.5K

Holland - Minis

Programmers - Analysts - Consultants

Consider applying your **Mini Assembler** knowledge to some really demanding technical applications including Communication Networks, Message-Switching, Process Control, Simulation, etc., with this International Systems/Manufacturing Group.

Bright and ambitious **Programmers, Analysts and Consultants** willing to contribute their ideas and become involved in projects at the forefront of technology will be offered superb career opportunities.

2-5 years' Mini Assembler experience in a non-commercial environment is required plus a relevant degree or additional experience in lieu.

Generous family relocation packages are offered plus resettlement advance, 8% holiday bonus, comprehensive medical and pension schemes, and house purchase assistance.

Salaries £10-17K

HONEYWELL L64 & 66

Consultants and Systems Analysts with solid background in programming, analysis and design for commercial/financial project on large Honeywell mainframe in London currently being undertaken by Software House. Excellent benefits and good prospects.

c £12K

PROJECT MANAGEMENT

Experience in custom-built systems on minis preferably gained in Software House environment required for this management position involving bidding, development, implementation and support in Applied Systems Division of Manufacturer. N.W. Home Counties location.

£10-12.5K

SALES CONSULTANTS

3+ years in selling environment (either in the motor trade or commercial/financial computer systems) required to join new sales team in UK, selling and supporting proven stand-alone system to retail motor trade.

c £15K + car

SYSTEMS ENGINEER

2+ years in logic design pref. in micros plus science/engineering degree for work in areas of bit slice and byte micros, also interfacing terminals and communications with Herts.-based company. Intellect important, plus mobility for variable length overseas assignments.

to £8.5K

SWITZERLAND

Software Engineers and Team Leaders required for design and development work at our Client's new Swiss office. Specific requirements are knowledge of quality assurance techniques, or telephone/telecomms systems, plus project management experience. Good German a considerable asset. Relocation package offered.

£15-25K

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We are recruiting for hundreds of companies throughout the UK and EEC requiring Analysts, Programmers, Designers etc. For a comprehensive list of openings complete and send the coupon to: MATRIX LTD FREEPOST, LONDON SW7 4BR

Name
Address
Position

(2725)

MINI COMPUTER ENGINEERS

Take a break and work on one of the best minis in the world - and at the same time get a sun tan and a substantial amount of money to bring home with you.

Our client is the main distributor for a major mini computer manufacturer, establishing a growing base of commercial systems in Saudi Arabia. They have the business but are short of experienced people to maintain it.

To attract high calibre engineers they have established a lavish life style for their employees - all at the company's expense. You will be living in a spacious villa with meals and household needs seen to by domestic staff. A car will be available for business and pleasure use, allowing you to make the most of your leisure time.

Obviously there is a substantial tax free salary to complete this exceptional package.

If you have 2 years sound experience on any commercial mini computer system and would like to know more about these bachelor status positions, please telephone (24 hour answer service) or write to Phil Chapman quoting ref: CW150-C.

(2778)

CAPP ASSOCIATES Computer and Professional Personnel Consultants

01-686 9693 AMP House, Dingwall Road, CROYDON CR0 2XA

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Are these the tools of your trade?

Database Expert

We require a Database specialist to join a new team of computer professionals in Swindon.

NERC is a Government funded body responsible for research in the environmental sciences.

Huge amounts of data relate to the environment, so database techniques have considerable potential within NERC. You will take a leading role in their evaluation and exploitation.

Qualifications and Experience

Candidates should normally have a degree (or equivalent) in a scientific or engineering discipline, and some postgraduate experience. Previous experience in the field of database is essential.

Salary and Conditions

The appointment will be made at Senior Scientific Officer level (£7,644 to £9,619 pa). Starting salaries may be above the minimum scale, according to age and experience. Benefits include a non-contributory pension scheme.

Telephone queries about the work to Mr. G. H. D. Darwall, on Swindon (0793) 40101 ext 379.

Application forms and further details are available from: Mrs. P. Judson, NERC Scientific Services, Wingate House, 56-58 Prospect Place, Swindon, Wilts SN1 3LN. Tel: Swindon (0793) 40101 ext 490.

Closing date for applications: 9th October 1980.

Please quote ref: 65.

Natural Environment Research Council (2737)

UNIVERSITY OF EDINBURGH

Edinburgh Regional Computing Centre

MICROCOMPUTING

The Centre provides a wide range of computing services to users in the University and Research Councils in the Edinburgh area. In response to recent developments in distributed computing, the Centre has established a Microcomputer Support Unit within its User Services Division.

Applications are invited for a key post in the Microcomputer Support Unit. The person appointed will join a small energetic team working on a range of personal computers. Current work involves the UCSD Pascal system and communications to the Edinburgh network. [illegible]

[illegible]

[illegible]

★ EAST MIDLANDS ★

★ COMMERCIAL PROGRAMMERS ★

IBM/ICL — COBOL

DEC RSX 11M/RSTS

Permanent or contract, 3-6 month assignments

Opportunities also available for candidates with other qualifications.

Contact Tony Bowman on 021-622 8234, after 7 p.m. 021-427 2871.

Fraser Williams Computer Consultants

[illegible] (2800)

datascene

BASIC + /BASIC + 2 PROGRAMMERS

City **£7500**

We are in contact with three banks in the City who are seeking programmers with upwards of eighteen months' experience in BASIC + BASIC +2, or AIMS. Successful applicants can expect to be working in a batch and real-time environment on applications such as foreign exchange and eurobonds. Opportunities for career progression are excellent and the employment packages offered are without equal. Ref: R/Gen.

COBOL PROGRAMMERS

S.W. London **£6-£7,000**

Two of our clients have vacancies for COBOL programmers with good experience in financial applications. Although specific hardware familiarity is not essential a background that includes Burroughs or modern Honeywell equipment would be an advantage. First-class conditions of employment apply in both cases and successful applicants can look forward to working in well disciplined teams and to good standards.

Ref: R4637/3

COBOL PROGRAMMERS

Middx. **£6-£8,000**

Several clients in the Middlesex area seek COBOL Programmers. A wide range of application areas is involved using either Honeywell or Univac equipment. We would like to hear from programmers with upwards of eighteen months' experience especially those with Data Base or On-line experience, to discuss opportunities within the foods, aircraft and other industries.

Ref: R4625

COBOL PROGRAMMER

SW London **£8,500**

A well-known toy company are expanding their Data Processing department and require an experienced Analyst/Programmer to complement their existing team. DEC hardware is used and a background on Cobol or Basic would be particularly appropriate. Successful applicants, who should ideally have 3-4 years' experience, can expect to work in a variety of applications areas and utilise their skills to the full. Generous company benefits are offered.

Ref: R4514

The above vacancies are only a small selection from those currently on our files and we are always delighted to talk to experienced Systems and Programming staff wishing to further their careers.

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Our client is a household name who deal in personal cosmetics and who are deeply involved in D.P. They seek IBM COBOL Programmers with 18 months' experience for their IBM 4341 machine. Ideally they will also have C.I.C.S. experience although training will be given if necessary. In return they offer a salary of c. £7,500, 5 weeks' annual leave, an annual bonus, pension scheme and discount on company products.

Ref: D4405

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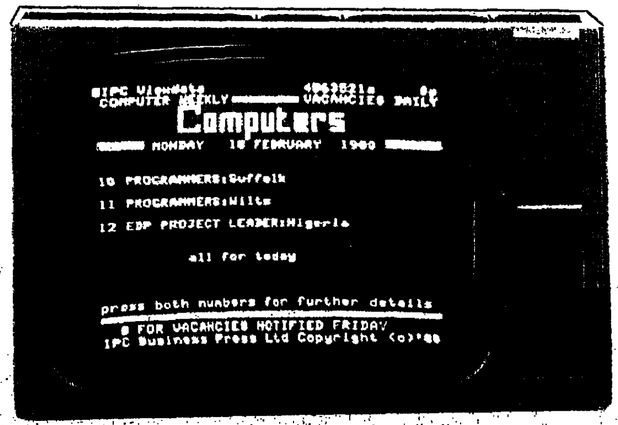

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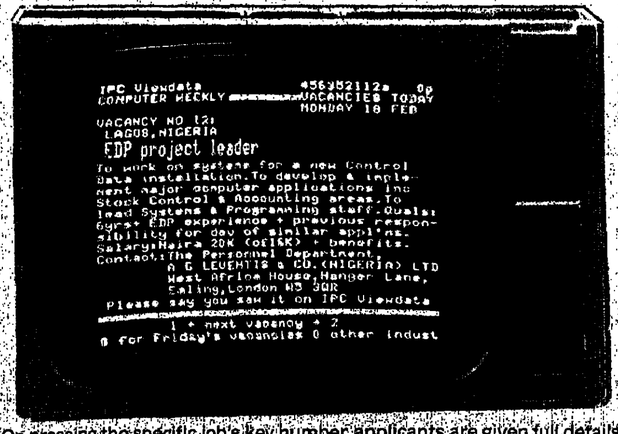

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(2773)

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DEPARTMENT OF COMPUTER SCIENCE

COMPUTER SOFTWARE TECHNICIAN GRADE 5

Applications are invited for the above post from applicants with a relevant degree (or MBCS) and several years of software experience.

The post will involve technical responsibility for the software employed in the Department's research and teaching laboratories, together with the supervision of another technician.

The laboratory computers include several large mini computers with extensive software and various microcomputers with limited software. Experience of VAX or PDP-11 or UNIX would be advantageous.

Salary scale £4,776-£6,577 p.a.

Applications in writing, giving full details of qualifications and experience, together with the names and addresses of two referees should be sent to Mrs E D Heavens, Senior Administrative Assistant, University of York, Heslington, York YO1 5DD by Friday, 3 October, 1980.

(2762)

DERBY LONSDALE COLLEGE OF HIGHER EDUCATION

Lecturer in Computer Studies

Duties to commence as soon as possible.

The post is offered at Lecturer Grade II but the opportunity exists for eventual progression to the Senior Lecturer salary scale.

Salary Scales:
Senior Lecturer: £8952-£10539-£11295. Lecturer Grade II: £6012-£9702.

Application forms and further particulars may be obtained from the Staffing Officer, Derby Lonsdale College of Higher Education, Kedleston Road, Derby DE3 1GB, telephone Derby 47181, to whom completed forms should be returned by 13th October, 1980.

(2740)

City of Coventry
TILE HILL COLLEGE OF FURTHER EDUCATION
Principal H E Avery, B.Sc., Ph.D.

LECTURER I in COMPUTING

[illegible]

Applications are invited for the above post to commence from 1st January [illegible] or earlier to teach and develop computing and data processing courses.

Further particulars and application forms from: The Principal, Tile Hill College of Further Education, Tile Hill Lane, Coventry CV4 9SU. Tel. Coventry [illegible], to whom completed forms should be returned by Tuesday, [illegible] September, 1980.

(2760)

The Polytechnic of Central London
School of Engineering and Science
Mathematics and Computing Division

TEMPORARY FULL-TIME LECTURER II
(fixed term appointment)
PART-TIME LECTURERS IN COMPUTING

There are urgent vacancies for the above and the courses in the area are at BSc HND and HND Endorsement levels and the subjects required to be taught are in the areas of Computer Systems (Hardware and Software) and Programming.

Application forms from the Establishment Office, PCL, 309 Regent Street, London W1R 8AL. (Tel: 01-580 2020 ext. 212).

(2742)

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Holland £20,000+p.a.

We are seeking someone to work for CDS in the Netherlands for an initial period of one year assisting a client with the installation of a 3850 Mass Storage system at an MVS/JES2 installation supporting a large number of TSO users. Candidates should be familiar with the overall ramifications of installing MSS including the planning, implementation and operational phases and in addition must be self-motivated and capable of working independently.

For further details please telephone or write to Brian Bidston at our UK offices, or call during evenings/weekends on 03446 5385.

(2783)

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Write or telephone for an Application form to:

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Personnel Department,
Agfa-Gevaert Limited,
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Brentford, Middlesex.
Tel: 01-560 2131.

(2801)

WEST MIDLANDS

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(2803)

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Currently 2,000 staff are employed to process this work manually in 9 centres situated in Northern England. The suitable candidate must be experienced in the design and implementation of computer systems.

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Salary Scale £7,032-£8,551 p.a.
(increase pending)

The job entails controlling and supervising teams of Analysts/Programmers involved in Systems Design, program writing, testing and implementation. The candidate will be closely involved with the users clarifying existing manual procedures and in the design of computer systems.

Application form, role specification and further information available from:

Personnel Division
Prescription Pricing Authority
Bridge House
152 Pilgrim Street
Newcastle upon Tyne NE1 6SN
Tel: N/cle. 25371'

CLOSING DATE 1st October, 1980 (2796)

Computer Systems Personnel
South Africa

The Centre for Computing Services of the Council for Scientific and Industrial Research (CSIR) in Pretoria, the administrative capital of South Africa, requires top-class systems personnel to cater for all the computing requirements of the Council.

The Centre operates three large machines via a control Data CYBER 174 running under NOS to service scientific engineering applications, and a dual loosely coupled IBM 370/158 running under MVS with TSO/SPF, CICS, etc. to service information processing applications.

The personnel we require will be responsible for the evaluation, implementation, maintenance and enhancement of the NOS and MVS operating systems and allied applications and data base/data communications software. They will be active in the area of performance measurement and the analysis and control of the operating systems and hardware, and will undertake the development of a variety of systems support software.

A B.Sc. degree or equivalent, ideally with computer science as one of the major subjects, will be a recommendation, although applicants at all levels of qualification will be considered whether they have previous systems programming experience or not. Complete in-service training is provided and staff members are encouraged to develop their expertise in appropriate areas of computing systems technology through the attendance of courses, symposia and the like. Working conditions are amenable to further study, and researchers are offered both practical and financial assistance.

Our salaries are competitive and our excellent fringe benefits include pension and medical aid schemes, group life insurance, a five-day week, up to 39 days' leave per year (plus the days between Christmas and New Year), an annual service bonus equal to a month's salary, outstanding recreational facilities including swimming pools, squash and tennis courts and pleasant work surroundings at the parklike Scientia, where the CSIR is situated.

Reasonable relocation costs will be paid in full and a settling-in allowance as well as house purchasing assistance will also be provided.

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If you would like to know more about the opportunities we offer, please contact THE SCIENTIFIC COUNSELLOR, CHICHESTER HOUSE, 278 HIGH HOLBORN, LONDON WC1V 7HE (telephone 01-242 1766) who will provide information on salaries and fringe benefits, job descriptions, and application forms. Applications should reach him not later than 2 October 1980.

CSIR **Council for Scientific and Industrial Research** (2739)

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based Central London
Salary range £9010 to £9880 p.a.
+ valuable travel concessions

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HOUNSLOW **To £11,000**
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At least 18 months to 2 years' analysis experience is required for this position with a manufacturing company.

COBOL PROGRAMMERS
Nr. MORDEN + HOUNSLOW **To £8,500**
Two companies are seeking COBOL programmers with 2-4 years' COBOL experience to work on development work.

SYSTEMS ANALYST
ROMFORD **c. £8,000**
A medium sized company is seeking someone with about one to two years' analysis experience.

ANALYST/PROGRAMMERS
PROGRAMMERS
ROMFORD **To £8,000**
COBOL and/or ASSEMBLER experience is required for these positions.

If you are interested in any of the above positions, please phone for an application form or write full details.

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LECTURER II IN COMPUTING

(2728)

Department of Business Studies

LECTURER II/SENIOR LECTURER

in Systems Analysis and computer applications in Management

Previous teaching experience not essential.
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Salary scale: Lecturer II — £5229 to £7785; Senior Lecturer — £7786 to £9822. (Interim award, subject to increase). London Allowance of £498 p.a. payable. Point of entry depends on qualifications and experience.

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ANALYSTS	£	No of vacancies
(DR/1960) 2 + years commercial	6750	6
(DR/1961) 3 + years financial	7500	8
(DR/1962) 4 + years (seniors)	8000	8

PROGRAMMERS	£	No of vacancies
(DR/1963) 2 + years COBOL	6250	8
(DR/1964) 3 + years COBOL	6750	5
(DR/1965) 4 + yrs (seniors) COBOL	7250	4

Contact Susan Stuart

Coventry

ANALYSTS	£	No. of vacancies
(DR/1966) 2 + years commercial	6600	3
(DR/1967) 4 + years (seniors)	7750	2

PROGRAMMERS	£	No. of vacancies
(DR/1968) 18 + months COBOL	5750	2
(DR/1969) 2 + years COBOL	6500	5
(DR/1970) 4 + yrs (seniors) COBOL	7800	6

Contact Susan Stuart

Leicestershire

ANALYSTS	£	No of vacancies
(DR/1971) 18 + mths commercial	6500	2
(DR/1972) 2 + yrs financial	6500	2
(DR/1973) 2 + yrs manufacturing	7000	2

PROGRAMMERS	£	No of vacancies
(DR/1974) 18 + months COBOL	6250	2
(DR/1975) 2 + years COBOL	6500	2
(DR/1976) 3 + years COBOL	7000	2

Contact Susan Stuart

Nottinghamshire

ANALYSTS	£	No. of vacancies
(DR/1977) 2 + years financial IBM	6750	3
(DR/1978) 3 + years commercial	7200	3
(DR/1979) 4 + years (seniors)	7750	4

PROGRAMMERS	£	No. of vacancies
(DR/1980) 2 + years COBOL	6500	3
(DR/1981) 3 + years COBOL	7000	4
(DR/1982) 4 + yrs (seniors)	7500	4

Contact Susan Stuart

Staffordshire

ANALYSTS	£	No of vacancies
(DR/1983) 2 + years commercial	6500	2
(DR/1984) 4 + years (seniors)	8000	2

PROGRAMMERS	£	No of vacancies
(DR/1985) 2 + years PL/1	6500	2
(DR/1986) 2 + years COBOL	6500	2
(DR/1987) 4 + yrs (seniors) COBOL	7500	5

Contact Susan Stuart

Greater Manchester

ANALYSTS	£	No of vacancies
(DR/1988) 12 + mths commercial	6000	6
(DR/1989) 2 + yrs manufacturing	7000	5
(DR/1990) 3 + years financial	7500	4
(DR/1991) 4 + years (seniors)	8000	2

PROGRAMMERS	£	No of vacancies
(DR/1992) 12 + months COBOL	5500	4
(DR/1993) 2 + years COBOL	6500	5
(DR/1994) 3 + years COBOL	7000	4
(DR/1995) 4 + yrs (seniors) COBOL	7500	3

Contact Cathy Scott

Merseyside

ANALYSTS	£	No of vacancies
(DR/1996) 12 + mths commercial	6000	6
(DR/1997) 2 + years production	6700	4
(DR/1998) 3 + years financial	7200	8
(DR/1999) 4 + years (seniors)	8250	3

PROGRAMMERS	£	No of vacancies
(DR/2000) 18 + months COBOL	6500	6
(DR/2001) 18 months IBM ASSEMBLER	7000	3
(DR/2002) 3 + years COBOL	7250	6
(DR/2003) 4 + yrs (seniors) COBOL	7800	4

Contact Cathy Scott

Lancashire

ANALYSTS	£	No of vacancies
(DR/2004) 12 + mths commercial	6000	2
(DR/2005) 18 + months financial	6500	2
(DR/2006) 2 + years manufacturing	7000	2
(DR/2007) 3 + years commercial	8000	2

Lancashire

PROGRAMMERS	£	No of vacancies
(DR/2008) 12 + months COBOL	5500	3
(DR/2009) 18 + months COBOL	6250	3
(DR/2010) 2 + years COBOL	6700	4
(DR/2011) 3 + years COBOL	7200	4

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Yorkshire

ANALYSTS	£	No of vacancies
(DR/2012) 12 + mths commercial	6500	3
(DR/2013) 18 + months financial	6800	4
(DR/2014) 2 + years retail	7300	4
(DR/2015) 3 + years commercial	7750	6

PROGRAMMERS	£	No of vacancies
(DR/2016) 12 + months RPGII	5500	2
(DR/2017) 18 + months COBOL	6250	5
(DR/2018) 2 + years COBOL	6500	4
(DR/2019) 3 + yrs (seniors) COBOL	7200	5

Contact Cathy Scott

Humberside

ANALYSTS	£	No of vacancies
(DR/2020) 2 + years manufacturing	6750	2
(DR/2021) 3 + years commercial	7500	2

PROGRAMMERS	£	No of vacancies
(DR/2022) 18 + months IBM ASSEMBLER	6500	2
(DR/2023) 3 + years COBOL	7000	2

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Cambridgeshire

ANALYSTS	£	No of vacancies
(DR/2024) 18 + months financial	6500	2
(DR/2025) 3 + yrs commercial	8500	3

PROGRAMMERS	£	No of vacancies
(DR/2026) 18 + months PL/1	6500	1
(DR/2027) 3 + years COBOL	7500	6
(DR/2028) 3 + years systems IBM	8000	2

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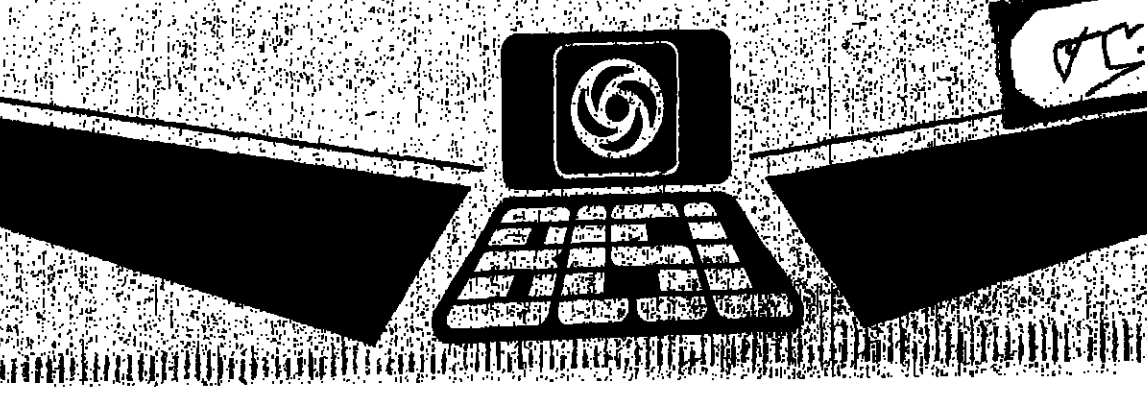
(2785)



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These jobs will appeal to people with slightly less experience than relevant to the Senior Systems positions but who, nevertheless, have the potential to aspire to a senior level within a reasonable period.
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THE SALES BIT

Emperor who didn't know how to delegate

DURING the process of considering possible topics on the broad subject of sales management, I found myself recalling a situation within a science fiction story I read several years ago. I believe it comes from the Foundation and Empire trilogy by Isaac Asimov.

In essence (with no guarantees for literary accuracy), our hero is summoned to the presence of the Emperor of the most powerful interplanetary empire within the galaxy. His arrival at the capital city is an awe-inspiring experience, such is the architectural grandeur of its setting and the technologically advanced state of its fundamental mechanism.

On reaching the imposing palace, the very threshold of his meeting with the seat of ultimate power, he experiences for the first time in his life the intimidating sensations of fear and uncertainty.

In trouble

Yet, despite its history of omnipotent power going back over innumerable millenia, the empire is in trouble. Since the advent of the new emperor, the economy has declined significantly; there have been rebellions on several outlying planets, there is unrest within the ministerial council and discontent among the people, even the hint of possible invasion by their traditional enemy from another galaxy.

Our hero's first job is to identify the root cause of the problem, a task which even the emperor himself has tackled with a total lack of success.

The journey through the labyrinthine corridors of the palace is extremely narrowing. Silent, menacing, robotic guards monitor each step of the intimidating route. Even an unkind thought might initiate personal annihilation.

Regal

Suddenly, he is there, within the ante-chamber, before the monolithic doors of the counselling room. In slow and total silence they swing open to reveal a room so large he can almost perceive across its floor the natural curvature of the planet. There are no furnishings, other than a band of red carpet leading from the door across to a golden desk at the furthest end of the room, so far away, the emperor sitting behind it can barely be identified.

As he walks the crimson causeway towards the pinnacle of power, he tries to ignore the butterflies cascading in his stomach. He is aware of a trickle of perspiration running down his temple and the clamminess of his hands. He can now see the emperor quite clearly in his regal robes of office, head bent, totally absorbed in some high matter of state.

He reaches the royal desk and stops, standing to attention, not daring to speak. The emperor is either too committed to his problem to recognise the arrival of his visitor, or perhaps exercising his autocratic prerogative of total ignorance.

Staggered

Time passes, and slowly our hero begins to regain his confidence.

Without moving his guard-like posture he strains his eyes down to observe the task in which the emperor is so deeply engrossed. He is staggered by what he sees, but instantly recognises the nature of the job he has to do.

The emperor is checking the invoices!

TRADER

COURSES AND CONFERENCES

Briefing sessions

INDUSTRY Briefing is a series of conferences organised by Infotech, designed to give detailed information on available data processing products and services. From October 15-17 the theme will be the IBM 4300 series. This conference will be held at the Portman Hotel.

From October 21-23 the subject is Which Point of Sale System?; from November 11-13, at the Tara Hotel the IBM System 38 will be under discussion; Which small business computer? will be held at Kensington Close from November 25-27. All venues are in London. For further information ring (0628) 39101.

From November 24-27 Afcet holds its annual computer congress, the Congres Afcet Informatique 1980. It is aimed at users, designers, researchers and representatives from the computer industry, and will include presentations on topics such as ADA, system specification, distributed systems and speech recognition. The conference will be held in Paris. For further details telephone Elisabeth Fayols on (33-1) 766 2423.

Removing the mystique

THE Institute of Chartered Accountants of Scotland is running a course to take the mystique out of computer installations, and provide a familiarity with computer terminology and concepts. No prior knowledge of computers is required. Subjects covered will include programming languages, cost of a computer system, operating systems and programming techniques. The course will be held from October 6-10 at the Central Hotel, Glasgow. The fee is £215 + VAT. Enquiries to: The Director of Post Qualifying Education, Institute of Chartered Accountants of Scotland, 27 Queen Street, Edinburgh EH2 1LA.

A course designed to provide data processing managers with an insight into significant changes likely to overtake the DP field during the next decade is being held at the Clive Hotel, London, on October 8-10. Organised by Control Data Institute, the course will focus on online computer usage, inventory control, material handling and other applications. The fee is £280 + VAT, and the course title is Data Processing in the 1980s. For further information contact Irene Phillips, Control Data, 179/199 Shaftesbury Avenue, London WC2H 8AR. Tel: (01) 240 3400.

Puzzle Answer

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TOOTING
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The South West Thames Regional Health Authority requires additional operations personnel to be based at the Regional Computer Centre, Springfield Hospital, London SW17. Computing within the centre, is currently based on powerful ICL 1904S hardware (soon to be upgraded to 2900 range equipment) running under George 3, which provides medical, financial and management information to the Region.
A two-shift system is in operation and other benefits include modern offices, coffee lounge and excellent recreational facilities both on-site and nearby.

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NEXT WEEK
NORTHERN RECRUITMENT FEATURE

Advertisers are reminded that the next Computer Weekly Northern Recruitment Feature will be published on September 25th and will highlight career opportunities in the North.

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Our client who is London based, and lastly becoming a market leader in the mini computer/financial systems field need three more sales executives to exploit this growing demand.

Ideally, you'll be from a computer environment with a strong commercial or financial background or have experience of selling to financial management. Thorough training will be given so you'll come to know the possibilities of the equipment backwards. And you won't be going in cold because our client is backing the exciting new launch of a new mini computer with a heavy advertising campaign in both the computer and financial press, as well as first class sales support including highly professional customer training facilities.

Mind you - this is a tough competitive business and that should give you a pretty good idea of the calibre of people our client is looking for. But with this demanding job you'll find the rewards amply match the achievement.

Basic salary ranges between £7,500 - £8,500 (Guarantees negotiable to c12K) and there's a commission scheme that makes the total package doubly interesting. Top people can earn well in excess of £17,000 a year. There's also a company car and the usual range of company fringe benefits.

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You're most likely to have a strong financial or commercial background as most of the clients you'll be dealing with will be accountants, or commercial directors. Some experience of computer based management accounting systems would also be useful.

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Recruitment LOGISTIX in Informatics

IBM Programmers

E.E.C. & Scandinavia: Salary to £18K

A leading U.S. multi-national with Data Centre and Development facilities in E.E.C. Countries and Scandinavia is seeking **IBM Applications Programmers** for its IBM 43XX installations. Candidates should have current programming experience in DL-1, although Assembler or COBOL knowledge will be considered. All candidates must have participated in the program development of an on-line real-time system. Of particular interest will be those who have worked with an IBM L.P. monitor. The Company can offer interesting projects in the area of S.N.A. network implementation. These positions represent an outstanding opportunity for career-minded individuals to enhance their technical skills whilst enjoying the diverse cultural benefits of another society.
Ref: L/38/A

Software Systems Development

Gtr. London Suburbs: Salary to £12K

A leading Systems Supplier situated on the rural outskirts of London has requested **LOGISTIX** to identify and recruit the following personnel:
PROGRAMMERS/DESIGNERS: Suitable candidates should have a degree in a numerate subject and practical programming experience in either Assembler or Cobol 68. Our client's in-house training programme will enhance your programming skills and develop your applications knowledge. You will work as a member of a small team designing, coding and testing real time applications software to meet in-house user specifications.
PROJECT LEADERS/MANAGERS: Candidates with proven ability as a Software Engineer or Designer in real-time applications are sought for Project Leader and Project Manager positions. It is particularly advantageous to have had experience in a similar role and to be conversant with resource management tools and user interfaces. However, candidates with the necessary software expertise and a real desire to combine innovative technical skills with a career in management will certainly appeal to our client.
THE BENEFITS: In addition to a superior salary our clients offer a comprehensive range of ancillary benefits, including relocation/legal expenses, temporary accommodation allowance, pension scheme, and health/medical facilities.
Ref: L/38/D

Real-Time Application

Pennine Counties: Salary to £10K

A foremost Total Systems Supplier has an urgent requirement for **Analyst/Programmers** and **Project Leaders** to join either its Customer Support or Software Development teams. Analyst/Programmers should possess at least 2 years' Basic+ or Assembler programming experience gained on any leading mini or micro-computer. Additionally, successful candidates will be expected to offer at least 12 months' analysis of either technical or commercial systems. Project Leaders should have a similar background supplemented by actual or potential management abilities. Location is unlikely to be a limiting factor as the company is well served by road and rail facilities.
Ref: L/38/C

Mini Software Development

N. Home Counties: Salary to £10K

Our client is a market-leading manufacturer of 16-bit mini-computers, with a well-established and expanding client base in both the scientific and commercial markets. **Development Programmers** offering a minimum of 18 months' Basic or Assembler on any mini-computer or micro-processor are urgently required for our client's Research and Development Headquarters. With a wide range of in-house hardware, unrivalled development facilities are available for ambitious, career-minded individuals. The salary and excellent range of benefits provided reflects not only the success of the Company, but also the premium attached to recruiting top calibre professionals.

Systems Consultants

London: Salary to £13K

Our client, a leading International Programming and Systems House based in Central London requires additional project team specialists. These positions will appeal to candidates who enjoy developing customers' systems and solving related business problems. Suitable candidates will be graduates with a minimum of two years' programming experience on any commercial machine whilst a knowledge of both high-level and low-level languages will be a distinct advantage. If you have designed at least one complete on-line system or have had project management responsibility then you will be considered for a more senior position.
Ref: L/38/E

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National food invoicing network likely

A NATIONWIDE electronic order and invoice network for food manufacturers, suppliers and retailers could come about as a result of trials which are currently in progress.

In the short term companies will order and invoice by means of magnetic tape and an on-line network is a very strong long-term possibility, following an amendment to the Finance Act 1980, under which electronic invoices are now acceptable to the Customs and Excise Board.

Boots the chemists and Makro already have a telephone link and such retailers as Fine Fare and Tescos and suppliers including Birds Eye Foods and Reckitt and Colman are sending sample orders and invoices to each other by magnetic tape.

The trials are being carried out under the watchful eye of the Article Number Association, the organisation formed to carry out bar coded article numbering and symbol marking for grocery product manufacturers and retailers in the UK.

A spokeswoman for the Article Number Association commented: "The trials are already well under way and we expect them to carry on until the early part of next year.

Trials

"We don't expect to experience too many technical problems – Boots and Makro are already sending sample orders and invoices by means of a telephone link as well as magnetic tape. Those companies are providing a good means of comparing the two methods."

The trials are based on the association's numbering system and a modified version of the transmission standards of SITPRO, Simplification of Trade Procedures Board.

Operational standards for the system have been approved by the association's council which represents 35 wholesalers and retailers and 400 manufacturers and suppliers.

The amendment to the Finance Act came about following recommendations by the association's trading data communications group, Tradacoms.

Firms wishing to adopt paperless or electronic ordering and invoicing must give one month's written notice to the VAT Commission. The Act gives Customs and Excise the right to inspect the computer and "any associated apparatus and material."

End of an era as Chubb closes

CONFIRMING the worst fears of the unions involved, cash register manufacturing by Chubb Cash at Brighton is to cease completely, with the loss of up to 550 jobs.

The Brighton company was the last UK-owned electronic cash register builder and used to be a major force in the UK market before being hit by foreign competition. Up to four years ago it was owned by Gross Cash Registers.

Attempts to keep the Brighton operation going included calls by the unions for import controls on Japanese BCRs and an undertaking by Andrew Bowden, MP, (Con, Brighton Kemptown), to put pressure on Trade Secretary John Nott to halt the import flood.

Chubb Cash chairman William Egar said that there had been discussions with the Department of Industry about financial backing but that only "limited facilities" had been offered. Egar commented: "It would have been easier if we had been in the North East or on Merseyside. Brighton is the wrong place."

Chubb Cash's profitable cash dispenser manufacturing operation at Brighton is not affected by the redundancies. But there have been warnings by TASS, the white collar section of the Amalgamated Union of Engineering Workers that there might be industrial action in the cash dispenser division to save jobs in the cash register sector.

NEWS IN BRIEF

Hopes for DoI viewdata

THE Department of Industry hopes to have the first stages of its internal viewdata systems (CW, April 3) operating well before the end of the year, following the completion of a feasibility study by Pactel.

It is likely to use an existing computer belonging to an external agency for speed of implementation and the biggest problem is thought to be finding the people to put its information into viewdata format.

BRITISH Telecom's Martlesham Research Centre near Ipswich is to be open to visitors all next week with about 20 exhibits showing the main areas of its development work aimed at improving telecommunications services and boosting the industry's exports.

THE French labour ministry has announced a programme to provide a state-funded training course in DP. Starting in October, running for 10½ months and taking 1,000 trainees, the courses will have half the places reserved for the unemployed.

Nixon to speak today

PERHAPS the most retiring of the UK heads of major computer companies, Eddie Nixon is to address the London branch of the British Computer Society this evening, Thursday, on "The benefits of an open market" – giving an alternative view to that of Dr Chris Wilson, managing director of ICL, who spoke to the branch on "The need for protection" in February. The meeting is at the Waldorf Hotel, Aldwych, starts at 6 for 6.30 and all are welcome.

Hewlett-Packard drops SOS

HEWLETT-PACKARD, the only major manufacturer to hang its hat on silicon-on-sapphire microelectronics technology, has decided that it is a dead end and although it will continue to manufacture SOS devices for some years, it has terminated advanced research.

The company, which has been researching the technology at its Deer Creek Laboratories at California's Silicon Valley has discovered that the speed advantage is not consistent as densities increase.

"We will continue to manufacture SOS devices for a few years to come yet, but we don't think the technology is a major first," Bob Grimm, director of Hewlett-Packard's technology research centre told Computer Weekly.

"At the moment we are trying to perfect growing silicon on a sapphire substrate."

Benefits

Grimm explained that, at dimensions of six microns, SOS devices are three times faster than equivalent bulk silicon devices, but at one micron line widths, only a 16% speed increase is possible.

"As the densities increase, the speed benefits decrease." He emphasised that HP would continue to make SOS devices of three to four microns, and not just for high speed applications.

"The technology is good as an insulating substrate and can be used in high voltage isolation applications. It is also less susceptible to radiation effects and the military is interested," said Grimm. However, disadvantages of the technology are that yields are low and the sapphire substrates cost about 10 times more than silicon substrates.

At present HP uses SOS to make 16-bit microprocessors, bus-controller chips for the IEEE 488 interface bus, and other communication chips. It also plans to continue developing higher density and higher speed SOS memories beyond the existing 2K RAM and 32K ROM, including a 128K ROM.

Other companies which have worked on SOS include RCA and Intersil, but HP is the only firm to use it as the basis of major commercial products.

$150m bid for SEL

SYSTEMS Engineering Laboratories, builder of powerful 32-bit machines for scientific and industrial applications, is the subject of a takeover bid valued at about $150 million from Gould Inc. At one time the big electrical and electronics equipment manufacturer was understood to be a serious suitor for Modcomp.

Gould is reported to be interested in Systems Engineering as a means of strengthening its position in the factory automation and energy management industries. At least one other contender in the energy management business, Westinghouse Electric, already uses Systems Engineering machines in its OEM systems.

Bleak outlook for Insac as Govt starts to sell off SPL and SDL

THE future of Insac, the National Enterprise Board's software consortium, looks more uncertain than ever as the sale draws closer of the board's shares in two Insac founding members, SPL and Systems Designers.

The board is actively pursuing negotiations with possible purchasers for the two software houses, of which it currently owns 79.9% and 26% respectively.

SDL has agreed a settlement with Insac by which their relationship will be brought to a close. Insac provided help in setting up SysDes Inc, its US arm.

Insac is however pressing ahead with marketing the products of its acquisition in the US, Altergo Software Inc, which has now been renamed Insac Software Inc. It is intended to broaden the range of products offered, concentrating on aids to programmer productivity in contrast to current products that concern teleprocessing and machine productivity.

Insac Software is now based at Atlanta, Georgia and is headed by Joseph Ganem.

Front runner to buy SPL is the Dutch industrial company Estel. Chairman Peter Adams describes himself as "not worried" by this, as Holland is in the EEC, but the NEB is also looking for a UK buyer as this might be preferred by Industry Secretary Sir Keith Joseph who would have to approve the sale.

Two or three merchant banks are in discussions with the board about buying SDL. It is understood that one of these is Kleinwort Benson, which already has a stake in word processor maker Data Recall. Chairman Philip Swinstead hopes that, about three years after the sale, the firm's shares will be offered to the public.

Northern Telecom turmoil

TURMOIL still prevails at Northern Telecom Systems Corp, the firm whose UK arm is Data 100. About 400 NTSC workers in the US have just been permanently laid off as part of an effort to make its operations more efficient.

NTSC was formed by Northern Telecom of Canada after it acquired the two terminal manufacturers, Data 100 and Sycor, and merged their operations. NTSC has failed so badly to live up to the expectations of Northern Telecom in terms of growth that $95 million worth of goodwill looks like being written off (CW, July 31, 1980).

In addition, after merging its private digital exchange business with NTSC last year as part of its office technology strategy Northern Telecom is now moving it to another subsidiary so that it can concentrate on sorting out the problems of the troubled terminal manufacturer.

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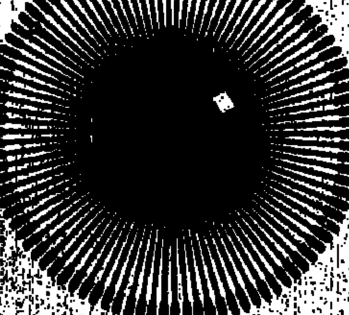

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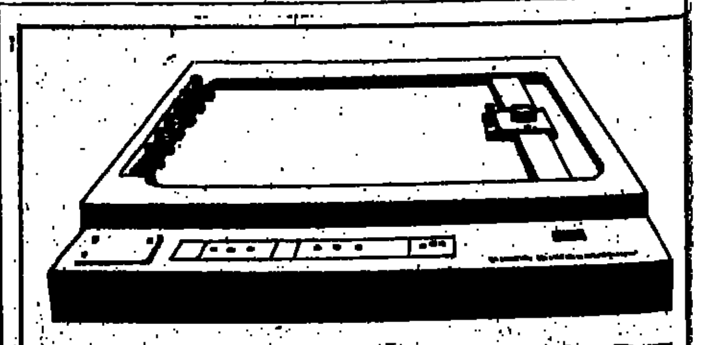

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